

DOMINION OF CANADA
DEPARTMENT OF AGRICULTURE

DIVISION OF BOTANY,

"
H. T. Gussow,

DOMINION BOTANIST.

DOMINION EXPERIMENTAL FARMS,

E. S. Archibald,

DIRECTOR.

REPORT

ON THE

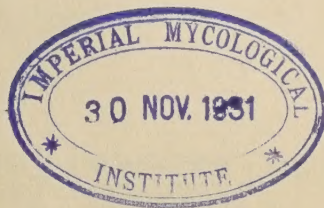
PREVALENCE OF PLANT DISEASES

IN THE

DOMINION OF CANADA

FOR THE YEARS

1927 AND 1928



. o o

COMPILED BY

J. B. McCURRY,
PLANT PATHOLOGIST.

DOMINION OF CANADA

DEPARTMENT OF AGRICULTURE

DOMINION EXPERIMENTAL FARMS,

E. S. ARCHER,

DIRECTOR.

DOMINION BOTANIST.



Report
ON THE
PREVALENCE OF PLANT DISEASES
IN THE
DOMINION OF CANADA
FOR THE YEARS
1927 AND 1928

LIST OF COLLABORATORS

Prince Edward Island

Hrwatt, J. L.
Hurst, R. R.
Peppin, S. G.

Dominion Laboratory
of Plant Pathology,
Charlottetown.

Nova Scotia

Donat, P. E.
Harrison, K. A.
Hockey, J. F.
Putnam, D. F.
Taylor, C. F.

Dominion Laboratory
of Plant Pathology,
Kentville.

New Brunswick

Harrison, A. L.
MacLeod, D. J.
Richardson, J. K.
Godwin, C. H.

Dominion Laboratory
of Plant Pathology,
Fredericton.

Quebec

Baribeau, B.
Racicot, H. N.

Dominion Laboratory of
Plant Pathology,
Ste. Anne de la Pocatiere.

Vanterpool, T. C.

Macdonald College.

Ontario

Berkely, G. H.
Chamberlain, G. C.

Dominion Laboratory of
Plant Pathology,
St. Catharines.

Dearnness, J.
Drayton, F. L.
Fraser, J. G. Carl,
Groh, Herbert,
Jones, D. H.
Hicks, A. J.
McCallum, A. W.
Major, T. G.
Mounce, Miss Trene,
Tucker, John.

London.
Division of Botany, Ottawa.
Cereal Division, Ottawa.
Division of Botany, Ottawa.
Ontario Agricultural College, Guelph.
Division of Botany, Ottawa.
Division of Botany, Ottawa.
Tobacco Division, Ottawa.
Division of Botany, Ottawa.
Division of Botany, Ottawa.

Manitoba

Bailey, D. L.
Brown, A. M.
Conners, I. L.
Craigie, J. H.
Gordon, W. L.
Greaney, F. J.
Hanna, W. F.
Johnson, T.
Newton, Miss Margaret,
Peturson, B.
Popp, Wm.

Dominion Rust Research Laboratory,
Winnipeg.

Saskatchewan

Russell, R. C.
Sallans, B. J.
Sallans, W. G.
Scannell, J. W.
Scott, G. A.
Simmonds, P. M.

Dominion Laboratory
of Plant Pathology,
Saskatoon.

Alberta

Broadfoot, W. C.
Cormack, M. W.

Dominion Laboratory
of Plant Pathology
Edmonton.

Henry, A. W.

University of Alberta, Edmonton.

Marriott, J. W.
Sanford, G. B.

Dominion Laboratory
of Plant Pathology
Edmonton.

British Columbia

McLarty, H. R.
MacLeod, H. S.
Roger, J. C.
Wolliams, G. E.

Dominion Laboratory
of Plant Pathology,
Summerland.

DISEASES OF CEREAL CROPS.

WHEAT.

STEM RUST -- Puccinia graminis Pers.

PRINCE EDWARD ISLAND

1927 - General but not considered serious. There was little noticeable variation in the degree of infection upon the standard varieties in the rust nurseries.

1928 - Infection general in the three counties, in some districts being unusually heavy.

NOVA SCOTIA

1927 - Though common, rust did not appear to cause much damage. Infection was somewhat heavier on account of wet period.

1928 - General infections observed in different parts of the province. Several severe cases Hants and Kings counties.

NEW BRUNSWICK

1927 - Observed generally in York and Sudbury counties. Infection heavier than usual.

1928 - Widespread but of no serious consequence.

QUEBEC

1927 - Trace reported in rust nurseries at Ste. Anne de la Pocatiere.

1928 - Only a trace of this rust was observed this year and it developed very late, although there was a heavy infection of the few barberry bushes in the vicinity.

ONTARIO

1927 - This disease was general throughout the province. Especially severe case reported from Kapuskasing.

1928 - Occurred in different localities but no serious cases reported.

MANITOBA and SASKATCHEWAN

1927 - "Rust developed in epidemic form in most parts

of Manitoba and Saskatchewan. The first traces of rust were discovered at Winnipeg and in the experimental plots at Morden on July 6. By July 18 a light infection was general in Manitoba as far north as Winnipeg. Little change was evident in the amount of rust in the fields until towards the last of July. Several days of hot weather, from July 23 to July 27, evidently stimulated the development of the organism in the plants for infections became considerably more common by the first of August. The first eight days of August were cool, and both wheat and rust made slow progress during that time, although heavy dews made conditions favourable for infection of the plants. The temperature for the week beginning August 9 was hot and imparted a decided stimulus to the development of the rust mycelia in the wheat plants, so that by August 16 the situation was decidedly alarming. Following that date, the progress of the rust proceeded apace, with the result that Western Canada suffered one of its worst rust epidemics in history."

- 1928 - "In 1928 the damage from rust was negligible. "The first trace of rust was discovered at Winnipeg on July 9th and at Morden on July 12. Evidently the infections from which these first two pustules arose, occurred at approximately the same time. By July 21 rust development had progressed somewhat. Secondary infections were becoming common on Garnet wheat in the Carmen-Morris-Morden district, although only a trace was yet present on Marquis and other common wheats. Only traces of rust were found further west in Manitoba through Treberne, Glenboro, and Killarney to Deloraine. In the durum-growing area in southwestern Manitoba, no rust was found up to this time, and, in fact, the durum wheats remained almost free of rust all the season. Along the Winnipeg-Brandon line, scattered infections could be found. "It was not until July 20 that any trace of rust was found in southeastern Saskatchewan. By this date also a few infections were found at Saskatoon. Secondary infection was found in a winter-wheat plot at the University at Saskatoon.

The dull wet weather cleared up about the first of August, and the grain ripened fast during the next two weeks. In both Manitoba and Saskatchewan the rapid ripening of the grain brought to a sudden ending the advance of rust."

ALBERTA

1927 - "In Alberta rust was less severe and did not cause any appreciable damage, although as high as 60 per cent infections occurred around Camrose, where shrinking of the kernels was noticed, but in general the loss due to rust was negligible. The good fortune of Alberta is evidently attributable not to lack of conditions favourable for rust development, for there was abundant rainfall, but to the failure of spores to arrive early enough and in sufficiently large numbers to initiate an epidemic. However, more rust was present in Alberta this year than ever before, for the unusual amount of precipitation delayed the early maturing of the grain, and gave the earlier arriving spores an opportunity of becoming established. Rust was found, moreover, farther north than in any previous year, occurring at Beaver Lodge for the first time on record."

1928 - Collected first (August 8) at Aldersyde, just south of Calgary. Very light infections found scattered over the province as far north as Edmonton. Scarcely more than a trace appeared anywhere in Alberta, and no appreciable damage resulted.

BRITISH COLUMBIA

1927 - Trace present on Vancouver Island.

1928 - Slight infections reported from Salmon Arm and Sidney.

LEAF RUST -- Puccinia triticina Eriks.

PRINCE EDWARD ISLAND

1927 - General infection on all varieties causing slight damage.

1928 - Light infections reported.

WHEAT

NOVA SCOTIA

- 1927 - Severe infections observed in rust nurseries at Kentville. Also in Musquodoboit on the Garnet variety.

NEW BRUNSWICK

- 1928 - Generally distributed in York county but of little importance.

QUEBEC

- 1928 - Very prevalent as usual but damage caused most-likely slight.

ONTARIO

General infection in experimental plots in 1927 and 1928.

MANITOBA and
SASKATCHEWAN

- 1927 - Leaf rust of wheat appeared in southern Manitoba and southeastern Saskatchewan during the third week of June. Its spread and development were rapid, so that by the middle of July, it had become fairly abundant and was obviously beginning to do a good deal of harm.
- 1928 - Leaf rust was present as usual but appeared somewhat later than last year and was much less severe.

ALBERTA

- 1927 - Leaf rust was very prevalent being similar in distribution to that of stem rust. This rust was heavy enough to appear to be causing injury. While present in the experimental plots at Edmonton, it was not abundant.
- 1928 - Earliest collection at Edmonton on June 28 on winter wheat. General in most fields. Light to medium infections. Damage - trace to slight.

STRIPE RUST -- Puccinia glumarum (Schm.) Erikss. & Henn.

ALBERTA

- 1927 - This disease, which was recorded for the first time in Western Canada in 1926, was again observed this year on August 20, on both leaves

and glumes of a number of varieties of wheat growing in a plot impractically the same location as the plot in which the infection occurred the year before. The Hordeum jubatum nearby was also, again, infected with stripe rust, so that overwintering of the inoculum is suggested. On September 20 stripe rust was observed only on the leaves in eleven wheat fields from Cardston, southeast toward the Montana boundry, and also on Hordeum jubatum. Only two cases of severe infection were seen.

- 1928 - This disease was found on a number of varieties of spring and winter wheat. Of 64 varieties exposed to infection, only one variety (Chagot) was severely rusted, one variety had medium infection, and 53 varieties showed a trace. These observations indicate that the commonly grown varieties of wheat are fairly resistant to the form of stripe rust in Alberta.

Spring wheat field showing a general infection found at Hanna. Damage slight.

BRITISH COLUMBIA

- 1928 - Stripe rust occurred commonly on Vancouver Island but no extensive survey was made of the province. It was also reported from Sidney.

BUNT OR STINKING SMUT -- Tilletia Caries (DC.) Tul.
and Tilletia foetens (Berk) Trel.

PRINCE EDWARD ISLAND

- 1927 - Light infection at Experimental Station.

- 1928 - Rarely found.

NEW BRUNSWICK

- 1928 - Slight occurrence in widely separated fields in York County.

QUEBEC

- 1928 - Infection of about 3 per cent was found in Kamouraska County on Preston wheat. In several other varieties a few affected heads were found.

WHEAT

MANITOBA

1927 - Severe infection at Miniota in Mindum wheat.

1928 - Eight to twelve per cent in Experimental plots grown from untreated seed at Brandon.

SASKATCHEWAN

1927 - Infections of 2.4 per cent at Indian Head and 5.7 per cent at Scott.

1928 - Infection in untreated plots at Indian Head ranged from 16.5 to 20.3 per cent.

Other cases of bunt were recorded from fields throughout the grain-growing area, causing appreciable loss. Reports from Carnduff and Maryfield showed 5 and 6 per cent respectively.

ALBERTA

1927 - Relatively scarce, especially in older settled and better farmed districts. Occasional fields with a serious amount of infection.

1928 - Widely scattered traces of infection. In no case abundant, except in experimental plots.

LOOSE SMUT -- Ustilago Tritici (Pers.) Jens.

PRINCE EDWARD ISLAND

1927 - Generally distributed but rarely severe.

1928 - Infection slight except in rare cases. Found in all three Counties.

NOVA SCOTIA

1928 - One field of Marquis in Pictou county showed about 3 per cent infection, while another field was infected to about 10 per cent.

NEW BRUNSWICK

1927 - Observed in York county. Slight infection only.

1928 - Slight occurrence in plots at Experimental Farm, Fredericton.

QUEBEC

1927 - One field in Kamouraska county showed 10 per cent infection.

- 1928 - Several heavy infections reported from St. Pascal, Kamouraska county, varying from 16 to 36 per cent.

ONTARIO

This disease was observed in the Ottawa district both years.

SASKATCHEWAN

- 1927 - Reported from different parts of the province. Trace to 2 per cent.
- 1928 - Many reports received from widely separated points; trace to 2 per cent.

ALBERTA

- 1927 - Infection general but not severe.
- 1928 - Much more common than bunt. Light infections generally distributed in fields scattered over the province.

ERGOT -- Claviceps purpurea (Fr.) Tul.

QUEBEC

- 1928 - Trace only reported.

MANITOBA

- 1928 - Very common in some fields. At Morden, 1 per cent infection found in a field of Marquis. Also a trace in a field of Garnet.

SASKATCHEWAN

- 1927 - Slight infections reported from Indian Head and from the University experimental plots at Saskatoon.
- 1928 - Occurrence common. Traces found at Benson, Summerberry, and Maryfield.

ALBERTA

- 1927 - Very common lowering grades of common wheat. Red Bobs particularly susceptible.
- 1928 - Much less abundant than in 1927. Only a few infected plants found in the field though Sclerotia were noted in several seed samples.

WHEAT SCAB OR HEAD BLIGHT - Gibberella Saubinetii
(Mont.) Sacc.

PRINCE EDWARD ISLAND

1927 - This disease caused considerable damage in Huron and Red Fife.

NEW BRUNSWICK

1927 - Isolated infections only observed. Of no serious consequence.

QUEBEC

1928 - One two-per cent infection found in experimental plots at Ste. Anne de la Pocatiere.

MANITOBA

1928 - This disease was very prevalent in Manitoba this year, the warm moist season providing favourable conditions for its development. Plants were attacked by a light general infection varying from a trace to 3 per cent, except in certain low spots where plants were heavily attacked. In plots of Reward at Winnipeg 80 to 100 per cent of the plants were infected.

SASKATCHEWAN

1927 - Traces found at Indian Head and Saskatoon.

1928 - Slight infection found on Marquis wheat at Saskatoon and Trossachs.

ALBERTA

1928 - One collection of a typical blighted head was made at Edmonton.

FOOT AND ROOT ROTS

MANITOBA

1927 - Root rot caused by Helminthosporium sativum P.K. & B. was reported from different parts of the province, indicating a well distributed infection ranging from slight to 18 per cent.

1928 - The survey this year again showed this disease to be widely distributed. Infection - trace to 5 per cent.

SASKATCHEWAN

- 1927 - Root rot caused by Helminthosporium. Light to moderate general infection present in field crops (trace to 12 per cent). In experimental plots 27 to 60 per cent was noted, being much more severe than the previous year.
- 1928 - Common causing variable loss.
- 1927 - Take-all caused by Ophiobolus graminis Sacc. Eighty-three reports received from different points indicated a wide distribution, infection varying from a trace to as high as 25 per cent.

ALBERTA

- 1927 - Root rots caused by Helminthosporium sativum P.B. & B., Fusarium spp., Wojnowicia graminis (McAlp.) Sacc. & D. Sacc., and Leptosphaeria herpotrichoides De Not. These rots were common on the University plots, especially on early varieties.

- 1928 - Damage in individual fields usually less than that caused by take-all. Aggregate damage, however, considerable and extending over a wider area than take-all. As frequently more than one organism was present, it was impossible to estimate the damage done by each. Wheat in practically every field affected with one or more of these organisms.

Take-all caused by Ophiobolus graminis Sacc., was prevalent and destructive in 1928. Damage ranged 5 to 30 per cent of the crop in individual fields. Although found in all soil types, the disease was most common and destructive on the black soils and next on the transitional type.

GLUME BLOTCH -- Septoria nodorum Berk.

NEW BRUNSWICK

- 1927 - Serious infection observed at the Dominion Experimental Farm.

- 1928 - Moderate infection in York county.

MANITOBA

- 1928 - Reported from Graysville, Plum Coulee, and Jordan. Considerable injury to heads of fully

grown plants. Disease seemed to be developing rapidly on late wheat.

SASKATCHEWAN

- 1927 - Slight infections reported from Glasnevin, Carnduff, St. Gregor, Speddington, Perdue, St. Brieux, and Dysart. Severe on some plots at Indian Head.
- 1928 - In a field of Marquis at Maryfield about 50 per cent of the heads were infected. One section of a field at St. Brieux showed about 60 per cent infection. Light infections from a trace to 5 per cent were reported from Cudworth, Rosthern, Resource, Plunkett, Macoun, Humbolt, Melaval, Hitchcock, Alemada, Forbisher, and Boharm. Damage caused was greater where heads had been knocked down by hail.

ALBERTA

- 1927 - Glume blotch of wheat was exceptionally prevalent throughout the entire area surveyed. It was most severe in the general High River - Nanton - Vulcan - Claresholm area. This severity seemed to have been increased by hail damage.
- 1928 - First report made July 16 from Morrin. This disease was very prevalent all over the province but more common in southern Alberta than farther north. It was not as severe as in 1927 and the damage caused was apparently slight. It was noticeable that late stools were often the most heavily infected.

POWDERY MILDEW -- Erysiphe graminis DC.

NEW BRUNSWICK

- 1928 - A few slight cases reported in York county.

SASKATCHEWAN

- 1928 - Mere trace reported. There was, however, a moderate infection on late sown Little Club in the experimental plots at Saskatoon.

ALBERTA

- 1927 - Abundant on winter and spring wheat in field plots at the University of Alberta on October 18.

- 1928 - First collection on June 11 on winter wheat at Edmonton. Later found on spring wheat at Edmonton, Spruce Grove, Vermilion, and Tofield. Some damage in the experimental plots at Edmonton, no damage observed elsewhere.

BRITISH COLUMBIA

- 1928 - Collected at Armstrong.

LEAF SPOT -- Septoria Spp.

SASKATCHEWAN

- 1928 - Moderate to heavy infection sometimes killing leaves prematurely. Reported from Yorkton, Wroxton, Melville, Prud'homme, Carmel, Kamsack, Muenster, Englefeld, St. Gregor, and Verigin. Traces of leaf spot caused by Septoria Tritici Desm. were found at Saskatoon, Duff, Totzke, Dane, and Bruno.

ALBERTA

- 1928 - Small brown spots with light borders. Common in southwestern Alberta. Lighter infections found elsewhere. Possibly caused by Septoria sp. Not identified.

BACTERIAL DISEASESBLACK CHAFF -- Pseudomonas translucens J.J. & R.
var undulosum J.J. & R.

NEW BRUNSWICK

- 1927 - Slight infections reported from York county.
- 1928 - Widespread but of no serious consequence.

MANITOBA

- 1928 - Very severe attack of this disease on some hybrids and new varieties at Winnipeg, causing severe damage. At Graysville a field of Ceres wheat was badly attacked, in some areas 100 per cent of the Ceres plants were severely infected causing considerable loss.

ALBERTA

- 1927 - A trace of black chaff was collected at such widely separated points as Westlock, Lacombe, Youngstown, and Claresholm. It was easiest to find in what proved to be one of the driest parts of the crop area. Damage - trace to light.

WHEAT

- 12 -

BASAL GLUME ROT -- Bacterium atrofaciens McCulloch

NOVA SCOTIA

- 1927 - This disease was present to a slight extent on Ceres variety of wheat in the rust nurseries at Kentville.

SASKATCHEWAN

- 1927 - This disease was common this season and quite severe in some localities. Traces of this disease were found at Balcarres, St. Brieux, Carnduff, Indian Head, Kerrobert, and Disley. About 10 per cent infections were found at Waseca, Dysart, and Carmel. In one patch in a field at the latter point easily 90 per cent of the plants were diseased.

ALBERTA

- 1927 - Observed in many fields, but never more than a trace, it being usually confined to one spikelet per head, here and there, throughout the field. In view of the moist season which prevailed, it would seem that other factors were lacking for a serious development of this disease.
- 1928 - This disease was very common, being found in all parts of the province. Red Bobs appeared to be especially susceptible. Damage caused was usually slight, - about 2 to 3 per cent.

MISCELLANEOUS

LEAF SPOT (Cause undetermined).

SASKATCHEWAN

- 1928 - Heavy infection of a small white-centred leaf spot about 1 to 2 mm. in length was found at Patrick. This condition was accompanied by dark brown linear spots on the stems.

ALBERTA

- 1928 - Numerous small "colourless" spots on leaf blades. Especially prevalent at Edmonton. Different varieties of wheat showed marked differences in reaction.

HAIL DAMAGE

ALBERTA

1928 - Large losses from hail experienced. Damage 100 per cent in several districts.

FROST DAMAGE

ALBERTA

1928 - Most of the grain except that of the earliest varieties was frosted in the head before maturity. Damage from lowered grades very great.

CHEMICAL INJURY, ETC.

ALBERTA

1928 - Much damage to seed and seedlings resulted from using over strength solutions, sowing in dry soil, etc.

OATS

STEM RUST -- Puccinia graminis Pers.

PRINCE EDWARD ISLAND

1927 - On early crops this rust caused little damage. The infection observed on the rust nurseries at Charlottetown was trace to 5 per cent. It was more severe, however, on later maturing fields as a result of excessive moisture.

1928 - Slight infections observed; less than in 1927.

NOVA SCOTIA

1927 - Very prevalent, but not doing serious damage.

1928 - No report.

NEW BRUNSWICK

1927 - Light infection appeared late in the season.

1928 - No report.

QUEBEC

1927 - Trace to 5 per cent reported from Ste. Anne de la Pocatiere.

1928 - No report.

ONTARIO

1927 - This disease was reported slight to moderate from different parts of the province; especially prevalent in low-lying fields. A very severe case was reported from Kapuskasing. In the rust nurseries at Ottawa a trace to 10 per cent was recorded.

1928 - Light to moderate infections on late sown oats, especially on low land.

MANITOBA

1927 - Percentage of stem rust in 18 varieties of oats grown in uniform rust nurseries at Winnipeg, Brandon, and Morden in 1927.

Variety	Percentage infection of stem rust.		
	Winnipeg	Brandon	Morden
Victory	31	45	80
Gold Rain	30	40	80
Richland	tr.	0	0
Alaska	26	45	50
Red Rustproof	20	30	70
Monarch Strain	2	0	5
Joanette	15	30	60
White Tartar	tr.	0	10
Ruakura	32	45	10
Miniota x White Tar-	tr.	0	0
tar.			
Green Mountain	tr.	0	0
Heigira Strain	tr.	0	0
Banner	20	40	80
Victory x White Tar-	tr.	0	0
tar.			
O.A.C. No. 72	16	40	70
Iowar	12	35	30
Iogold	tr.	0	10
Iowa 444	8	35	10

1928 - Trace to 100 per cent of plants infected, severity ranging from 5 to 20 per cent.

SASKATCHEWAN

1927 - Percentage of stem rust in uniform rust nurseries.

Variety	Saskatoon	Indian	Swift	Rosthern	Scott
		Head	Current		
Victory	45	8	3	28	25
Gold Rain	48	6	3	25	10

- 15 -

Richland	10	0	0	5	25
Alaska	50	40	5	20	22
Red Rustproof	20	2	tr.	55	45
Monarch Strain	10	0	0	5	5
Joanette	25	tr.	tr.	15	15
White Tartar	25	tr.	0	5	5
Ruakura	40	5	2	15	15
Miniota x White	10	tr.	tr.	5	5
Tartar					
Green Mountain	15	tr.	0	8	7
Heigira Strain	10	0	0	5	5
Banner	50	7	7	28	29
Victory x White	15	5	3	6	5
Tartar					
O.A.C. No. 72	45	8	3	27	26
Iowar	45	6	3	27	27
Iogold	12	tr.	tr.	5	6
Iowa 444	45	25	6	8	8

1928 - No reports received.

ALBERTA

1927 - Percentage of stem rust in uniform rust nurseries.

Variety	Lethbridge	Lacombe	Edmonton	Beaver-lodge
Victory	tr.	tr.	tr.	0
Gold Rain	tr.	tr.	tr.	0
Richland	0	0	tr.	0
Alaska	0	tr.	tr.	0
Red Rustproof	0	0	tr.	0
Monarch Strain	0	0	0	0
Joanette	0	0	tr.	0
White Tartar	0	0	tr.	0
Ruakura	tr.	0	tr.	0
Miniota x White	0	0	0	0
Tartar				
Green Mountain	0	0	tr.	0
Heigira Strain	0	0	0	0
Banner	0	tr.	tr.	0
Victory x White	0	0	0	0
Tartar				
O.A.C. No. 72	0	tr.	tr.	0
Iowar	0	tr.	tr.	0
Iogold	0	tr.	0	0
Iowa 444	0	0	0	0

- 1928 - The first report of this rust was made on August 1st, a specimen having been collected about 20 miles west of Edmonton. Numerous infections were found later, south and east of Edmonton, but the damage in no case exceeded a trace.

BRITISH COLUMBIA

- 1927 - Apparently absent (Summerland).

CROWN or LEAF RUST -- Puccinia coronata Cda.

PRINCE EDWARD ISLAND

- 1927 - As a result of the moist season there was a considerable amount of crown rust, particularly damaging late maturing crops.

- 1928 - General moderate infection observed.

NOVA SCOTIA

- 1927 - Several severe cases reported in Kings and Colchester counties.

- 1928 - Light to severe infections reported from Colchester, Cumberland, Kings and Pictou counties, doing considerable damage.

NEW BRUNSWICK

- 1927 - Moderate infection appeared late in the season.

- 1928 - Infection widespread but of no serious consequence.

QUEBEC

- 1927 - Reported from Megantic and Cap Rouge.

- 1928 - No report received.

ONTARIO

- 1928 - Light infections observed in the Ottawa district. One low-lying field severely infected. No other reports received.

MANITOBA

- 1928 - Reported from Rosebank, Winkler, and Graysville. Trace to 100 per cent of plants affected; severity 10 to 25 per cent. Damage very light.

SASKATCHEWAN

- 1928 - Reported from Lorlie, Chaplin, Carlyle, Grenfell, Humboldt, Wolsely, Percival, and Saskatoon. Only a slight trace observed at any point. A moderate infection was reported from Indian Head.

ALBERTA

- 1928 - Apparently absent (Edmonton).

LOOSE SMUT -- Ustilago Avenae (Pers.) Jens.

NOVA SCOTIA

- 1927 - Moderate infections observed in Colchester, Antigonish, Kings, and Pictou counties.

NEW BRUNSWICK

- 1927 - Very slight infection in York county.
1928 - Quite severe generally.

QUEBEC

- 1927 - Moderate infections reported from Megantic, Chicoutimi, and North Wakefield.
1928 - A very severe case was reported from Kamouraska county, 60 per cent of the heads being infected.

ONTARIO

- 1928 - Observed generally in the Ottawa district. Specimens for examination were received from a correspondent in Peterborough county.

MANITOBA

- 1928 - General infections reported from Morden, Miami, Winnipeg, and Brandon; trace to 4.5 per cent.

SASKATCHEWAN

- 1927 - Trace to 5 per cent reported from Moose Jaw, Indian Head, Qu'Appelle, Antler, Storthoaks, Kelliher, Fillmore, and Whitewood.
1928 - Eighteen reports from points widely separated, showed this disease to be distributed generally throughout southern Saskatchewan. Infections, however, were not serious ranging from a trace to 3 per cent.

ALBERTA

- 1928 - Scattered infections over the province but much less common than covered smut.

BRITISH COLUMBIA

- 1928 - Reported from Victoria

COVERED SMUT -- Ustilago levis (K. & S.) Magn.

NOVA SCOTIA

- 1928 - In Colchester and Pictou counties 5 to 12 per cent was found in fields where seed had not been treated.

NEW BRUNSWICK

- 1927 - Very slight infection of covered smut was observed in York county. Damage caused was below the average.

- 1928 - Infections found general in distribution, sometimes doing severe damage.

ONTARIO

- 1928 - Found in several fields in the vicinity of Ottawa.

MANITOBA

- 1927 - Untreated seed produced 4 per cent covered smut at Brandon.

- 1928 - General infection ranging from a trace to 5 per cent.

SASKATCHEWAN

- 1927 - Thirty-two reports showed that covered smut was very common in southern Saskatchewan. Most of the fields examined had slight to 5 per cent infections. However, reports from Balcarres and Dysart recorded 15 per cent infection, Markinch, Balgonie, and Stranraer 20 per cent, and Stealeam 30 per cent.

- 1928 - Reports from thirty-four points recorded general occurrence of this disease ranging from very slight to 6 per cent. Reports from Willows, Heward, and Macoun recorded 10 per cent, 15 per cent, and 20 per cent respectively.

ALBERTA

- 1928 - This disease was very common causing considerable

damage. In one field more than 30 per cent of the heads were destroyed.

HEAD BLIGHT -- Gibberella Saubinetii (Mont.) Sacc.

NEW BRUNSWICK

1927 - Slight scattered infection reported from York county.

HALO BLIGHT -- Pseudomonas coronofaciens (Ch. Elliott) Stev.

NEW BRUNSWICK

1927 - Fairly common but not severe.

1928 - General in distribution but not serious.

QUEBEC

1927 - Serious on certain varieties.

ONTARIO

1928 - Reported from Simcoe county.

ALBERTA

1928 - This disease was observed, but was not very common.

BRITISH COLUMBIA

1928 - Found at Sidney.

LEAF SPOT -- Helminthosporium Avenae Eidam.

NEW BRUNSWICK

1927 - Light infection reported.

ERGOT -- Claviceps purpurea (Fr.) Tul.

ALBERTA

1927 - Found several times, but not abundant.

1928 - Light infection observed at Edmonton.

FOOT ROT -- Fusarium sp.

ALBERTA

1928 - Reported from Stettler.

ROOT ROTS -- Cause undetermined.

MANITOBA

- 1918 - Very general infection; many plants stunted and killed. Appeared to be caused by either Helminthosporium sp. or Fusarium sp.

NON-PARASITIC DISEASES

BLASTING OF HEADS

SASKATCHEWAN

- 1926 - Slight damage noticed at Indian Head in July.

ALBERTA

- 1928 - Caused much damage throughout the province.

BARLEY

STEM RUST -- Puccinia graminis Pers.

NEW BRUNSWICK

- 1927 - Infection general, sometimes severe.
1928 - Only a few cases reported.

ONTARIO

- 1928 - Moderate infection in Ottawa district. Very severe case at Kapuskasing.

BRITISH COLUMBIA

- 1928 - Reported from Sumas Prairie.

LEAF RUST -- Puccinia anomala Rostr.

MANITOBA

- 1927 - This disease was very prevalent; severest epidemic so far. From 60 to 100 per cent of the plants were affected, showing a trace to 5 per cent.

SASKATCHEWAN

- 1927 - Moderate infection reported from Indian Head.

ALBERTA

1927 - Not abundant, but easy to find on green volunteer barley.

1928 - A light infection of this rust was found at Strathmore.

STRIPE RUST -- Puccinia glumarum (Schm.) Erikss. & Henn.

ALBERTA

1928 - A light infection of this rust was found at Strathmore in the same field where leaf rust was found. Neighbouring Hordeum jubatum was also infected with stripe rust.

LOOSE SMUT -- Ustilago nuda (Jens.) Rostr.

NEW BRUNSWICK

1928 - Quite general but not severe.

ONTARIO

1928 - Light infections observed at the Central Experimental Farm and in a few fields in the Ottawa district. Several specimens sent from eastern Ontario by correspondents.

MANITOBA

1928 - Very light trace reported from Plum Coulee.

SASKATCHEWAN

1928 - Trace to 3 per cent reported from Rosthern, Dundurn, Alameda, Melville, Tiny, Kelliher, and Indian Head.

ALBERTA

1927 - Loose smut of barley scarcely ever exceeded one per cent, but being rather common, the aggregate loss was important.

1928 - Widely distributed, but less abundant and destructive than covered smut.

COVERED SMUT -- Ustilago Hordei (Pers.) K. & S.

NEW BRUNSWICK

1928 - Few slight cases reported.

SASKATCHEWAN

1927 - Trace to 2 per cent reported from different localities.

1928 - Eighteen reports from different points recorded light infections general in distribution. Infections varied from a trace to 6 per cent.

ALBERTA

1926 - This smut was very common and caused important losses. In one field between 30 and 40 per cent of the plants were infected.

ERGOT -- Claviceps purpurea (Fr.) Tul.

QUEBEC

1928 - Trace of ergot reported from Kamouraska county.

SASKATCHEWAN

1928 - Traces found at Indian Head and Rosthern.

ALBERTA

1927 - Fairly common; more than the usual amount being present.

1928 - Reported only once.

STRIPE -- Helminthosporium gramineum Rabh.

NEW BRUNSWICK

1928 - General in Carleton county.

QUEBEC

1928 - About 2 per cent found on Mensury barley at Ste. Anne de la Pocatiere.

MANITOBA

1928 - Barley stripe was quite prevalent, especially in late low fields. About 60 per cent of the plants were infected quite heavily.

SASKATCHEWAN

1927 - Slight infections at Indian Head and Saskatoon.

1928 - Trace reported from Rosthern. In a plot of Colless barley at Indian Head about 5 per cent of the plants were affected. Other varieties nearby were practically free.

ALBERTA

- 1927 - Common at University, especially on Canadian Thorpe.
- 1928 - Found in a number of fields throughout the province. Damage was slight. In experimental plots, however, considerable damage occurred, possibly as a result of earlier seeding than on farms.

FALSE STRIPE -- Cause undetermined.

SASKATCHEWAN

- 1928 - Trace observed at Rosthern.

NET BLOTCH -- Pyrenophora teres (Died.) Dreschl.
(Helminthosporium teres Sacc.)

NEW BRUNSWICK

- 1927 - Fairly common, but not of economic importance.

SASKATCHEWAN

- 1927 - Slight infection found throughout the southern part of the province.
- 1928 - This disease was reported from eighteen different localities, infections being usually light to moderate. However, at Headlands, Humboldt, and Vonda, severe cases were reported.

ALBERTA

- 1928 - Very abundant and widely distributed. Fields showing 100 per cent of the plants infected not uncommon. Appreciable damage is severe cases.

SPOT BLOTCH -- Helminthosporium sativum P.K. & B.

NEW BRUNSWICK

- 1927 - Slight infection generally distributed.

ALBERTA

- 1927 - This disease was common and at times severe.
- 1928 - Much less common and important than net blotch.

BRITISH COLUMBIA

- 1928 - Reported from Sidney.

BARLEY
RYE

- 24 -

SCALD -- Rhynchosporium secalis (Heins.) Davis.

SASKATCHEWAN

1927 - This disease was general in distribution, infection ranging from slight to moderate. A severe case occurred in the plots at Saskatoon.

1928 - Traces found at Rosthern and Alameda. Light infection reported from St. Gregor and Carlyle.

ALBERTA

1928 - A common disease in this province. In a few instances slight damage resulted.

TAKE-ALL -- Ophiobolus graminis Sacc.

SASKATCHEWAN

1928 - At Annaheim one dead plant of volunteer barley was noticed in a patch of wheat where take-all was plentiful. Upon examination this specimen was found to bear typical Ophiobolus mycelium.

LEAF BLOTCH -- Septoria Passerinii Sacc.

SASKATCHEWAN

1927 - Observed at Alameda.

1928 - At Maryfield a case was reported in which 25 to 30 per cent of the leaf area was affected.

BACTERIAL BLIGHT -- Pseudomonas translucens J.J. & R.

NEW BRUNSWICK

1928 - Only one case observed at the Dominion Experimental Station at Fredericton.

SASKATCHEWAN

1927 - Slight but general infection reported from Herbert.

RYE

STEM RUST -- Puccinia graminis Pers.

SASKATCHEWAN

1928 - Moderate infection at Lorlie.

LEAF RUST -- Puccinia dispersa Erikss.

SASKATCHEWAN

- 1928 - Light infections found from Indian Head, Bradwell, Semans, Mikado, and Yorkton. Heavy infections reported from Lipton and Duff.

ALBERTA

- 1927 - Very abundant on winter rye at Edmonton.
- 1928 - Collected at Edmonton, Tofield, and Vermilion. Damage, trace to slight.

ERGOT -- Claviceps purpurea (Fr.) Tul.

QUEBEC

- 1928 - A slight infection of 2 per cent found in a four-acre field at La Perade.

ONTARIO

- 1928 - Slight infection observed at Ottawa.

SASKATCHEWAN

- 1927 - Slight to moderate infections reported from Indian Head, Mikado, Carlyle, and Saskatoon. At Mortlach about 20 per cent of the heads were affected.
- 1928 - Trace to light infections reported from different parts of the province, moderate case at Indian Head, and a severe infection at Carnduff.

ALBERTA

- 1927 - Very abundant, several severe cases recorded.
- 1928 - Moderately common, 10 per cent damage in one field.

BLACK CHAFF -- Pseudomonas translucens J.J.& R.
var. Secalis (R.G.& J.) Stapp.

ALBERTA

- 1928 - One report from Coronation district.

FOOT ROT -- Helminthosporium sativum P.K.& B.

MANITOBA

- 1928 - Found in cultivated plots at Morden. Infection heavy and uneven. Damage 2 to 5 per cent.

RYE
ALFALFA

- 26 -

ALBERTA

1928 - One report. Very little damage.

ROOT ROT -- Fusarium sp.

SASKATCHEWAN

1928 - Modern infection at Rosthern.

LEAF AND STEM SPOT -- Cause undetermined

SASKATCHEWAN

1928 - Severe on an isolated plot at Rosthern.

POWDERY MILDEW -- Erysiphe graminis DC.

SASKATCHEWAN

1928 - Light infections reported from Indian Head.

D I S E A S E S O F F O R A G E A N D F I B R E C R O P S

ALFALFA

LEAF SPECK -- Pseudopeziza Medicaginis (Lib.) Sacc.

NEW BRUNSWICK

1927 - One slight and one moderate infection reported;
not sufficient to cause defoliation.

1928 - Quite general, but not severe; slight outbreak at
Dominion Experimental Station.

QUEBEC

1927 - Severe occurrence at Macdonald College, causing
yellowing of the leaves.

ONTARIO

1928 - Generally present but no case of defoliation.
observed.

SASKATCHEWAN

1927 - Reported from Kelliher and Saskatoon, causing
considerable fading and loss of the lower leaves.

ALBERTA

1928 - Present but causing no appreciable damage.

BRITISH COLUMBIA

1928 - Diseased specimens received from a correspondent.

CHEMICAL INJURY

BRITISH COLUMBIA

1928 - Sulphur dioxide injury reported from Trail.

WINTER INJURY

Winter killing was reported from western Ontario in 1927.

DOWNY MILDEW -- Peronospora Trifoliorum de Bary

ALBERTA

1928 - Causing considerable damage to individual plants at Edmonton and slight to medium damage in irrigated fields at Brooks. Also found at Olds, but causing no loss.

BRITISH COLUMBIA

1928 - Found at Huntingdon.

ROOT ROT -- Sclerotinia Sclerotiorum (Lib.) de Bary

ONTARIO

Found in plots at Central Experimental Farm both years.

ALBERTA

1928 - Observed in plots at Edmonton.

BRITISH COLUMBIA

1928 - Reported from Trail.

ROOT ROT -- Plenodomus meliloti Dearn. & Sanford.

ALBERTA

1928 - Common on alfalfa.

CLOVER.

RUST -- Uromyces Trifolii (Hedw. f.) Lev. and
U. Trifolii-repentis (Cast.) Linc.

NEW BRUNSWICK

1927 - General infection but no serious damage.

1928 - Only a few cases observed.

ONTARIO

1928 - Common at Ottawa.

POWDERY MILDEW -- Erysiphe Polygoni DC.

NEW BRUNSWICK

1927 - General moderate infection.

1928 - Quite general and severe in many localities.

QUEBEC

1927 - Reported from Lachute and St. Felicien.

SASKATCHEWAN

1927 - Fairly heavy infection on lower leaves at
University plots, Saskatoon.

ALBERTA

1927 - Abundant in different parts of the province.

1928 - Fairly common on different species of Trifolium,
but caused little loss.

ROOT ROT -- Plenodomus Meliloti Dearn. & Sanford.

ALBERTA

1928 - This disease was very common, often causing severe
damage.

LEAF SPOT -- Pseudopeziza Trifolii Fuck.

NEW BRUNSWICK

1927 - Slight general infection.

1928 - Only one case reported.

CLOVER
SWEET CLOVER
CORN

SOOTY SPOT -- Dothidella Trifolii (Pers.) Bayl.
Elliott & Stansf.
(Polythrincium Trifolii Kunze).

NEW BRUNSWICK

1927 - Slight general infection.

1928 - A few cases were observed in York county.

MOSAIC

NEW BRUNSWICK

1927 - Isolated specimens only found.

1928 - Of quite rare occurrence.

SWEET CLOVER.

STEM CANKER -- Ascochyta Meliloti (Trel.) Davis

SASKATCHEWAN

1927 - Light injury reported from Saskatoon and Yorkton.

ALBERTA

1928 - Often severe accompanied by appreciable damage.

WHITE SPOT -- Cause undetermined.

BRITISH COLUMBIA

1928 - Reported at Trail.

CORN.

SMUT -- Ustilago Maydis (DC.) Cda.

NEW BRUNSWICK

1927 - Slight infection in York county.

1928 - There was quite a severe outbreak at the Dominion
Experimental Station, Fredericton.

QUEBEC

1928 - A 5 per cent infection was found in a small half-
acre field at Ste. Anne de la Pocatiere. The
disease was very severe.

ONTARIO

- 1927 - Observed at Ottawa both years. Several specimens
1928 submitted by correspondents. Isolated cases
reported from the Niagara district in 1928.

MANITOBA

- 1928 - Very heavy infection of corn smut on a piece of
land which had grown corn continuously for many
years. Severity of infection 8 to 10 per cent.

SASKATCHEWAN

- 1927 - Slight infections reported from Indian Head and
Montmartre.

BRITISH COLUMBIA

- 1928 - Observed at Nelson.

FLAX

RUST -- Helminthospora Lini (Pers.) Desm.

ONTARIO

- Present in the experimental plots at Ottawa both years.

MANITOBA

- 1928 - In an excellent crop of flax at Graysville, 100 per
cent of the plants were infected with rust.
Severity of infection varied from a trace to 8 per
cent.

SASKATCHEWAN

- 1927 - Common throughout the southern part of the province.
1928 - Flax rust was common this year in southern
Saskatchewan but generally slight or a mere trace.
Reported from Indian Head, Alameda, Admiral, Plato,
Young, Nokomis, Radville, and Hitchcock.

ALBERTA

- 1928 - Traces of this rust were found at Brooks and
Edmonton.

WILT -- Fusarium Lini Bolley

SASKATCHEWAN

- 1927 - A plot at the University of Saskatchewan, which had
been sown to flax continuously for some years was
practically wiped out.

ANTHRACNOSE -- Colletotrichum linicolum Perth. & Laff.

ALBERTA

1928 - Occurred in the experimental plots at Edmonton.

N O N - P A R A S I T I C D I S E A S E S

HEAT CANKER

ALBERTA

1928 - Slight damage in the experimental plots at Edmonton.

SUNFLOWER

WILT -- Sclerotinia Sclerotiorum (Lib.) Mass.

NEW BRUNSWICK

1927 - One case observed in Stanley township, York county.

1928 - Isolated specimens only observed.

QUEBEC

1927 - Severe cases observed in Kamouraska county.
Infection about 6 per cent.

1928 - A 5 per cent infection was found in a two-acre field. The disease appeared later this year and was not as severe as during the preceding year.

ONTARIO

1927 - Observed in the experimental plots at Ottawa
1928 both years.

SASKATCHEWAN

1927 - Several occurrences were reported. In a windbreak around a garden 3 per cent of the plants were affected. At Buchanan, in a similar windbreak the disease was present in about 40 per cent of the plants.

1928 - Trace observed at Indian Head. At Saltcoats over 10 per cent of the plants were affected.

ALBERTA

1928 - This disease was destructive in one field at Edmonton, causing 8 to 15 per cent loss.

SUNFLOWER
GRASSES

-32-

RUST -- Puccinia Helianthi Schw.

NEW BRUNSWICK

1927 - Isolated specimens observed in York county.

ONTARIO

- Observed at Ottawa in 1927 and 1928. No other reports received.

SASKATCHEWAN

1927 - Several slight occurrences reported from several points.

1928 - Trace reported at Rosthern.

ALBERTA

1928 - Light infections of this disease were observed at Edmonton.

LEAF SPOT -- Septoria Helianthi Ell. & Kellerm.

SASKATCHEWAN

1928 - The lower leaves were found heavily diseased in a small patch of sunflowers at Rosthern.

GRASSES (Cultivated)

Common Brome (Bromus inermis Leyes)

ERGOT - Claviceps purpurea (Fr.) Tul.

Trace to light infections found in different parts of Saskatchewan in 1927 and 1928. Traces were also found in Alberta in 1928.

LEAF BLOTCH - Pyrenophora Bromei (Died.) Drechs.

Moderate infection in Saskatchewan in 1927.

Kentucky Blue (Poa pratensis L.)

POWDERY MILDEW -- Erysiphe graminis DC.

This disease was very common in Alberta in 1928.

Timothy (Phleum pratense L.)

ERGOT -- Claviceps purpurea (Fr.) Tul.

In Nova Scotia light infections were reported from Kings county in both years.

RUST -- Puccinia Phlei-pratensis Erikss. & Henn.

Moderate infection reported from Kings county Nova Scotia in 1927. Reports of heavy infections on roadside plants were received from different points in Saskatchewan. Records for 1928 showed it to be common on wild plants in Alberta.

LEAF SPOT -- Scolecotrichum graminis Fckl.

This disease was reported from Alberta in 1928 having been found at Red Deer and Pincher Creek.

LEAF SPOT -- Heterosporium Phlei Gregory

Reported from Alberta in 1928. Common but not causing any appreciable damage.

WESTERN RYE GRASS (Agropyron tenerum Vasey)

ERGOT -- Claviceps purpurea (Fr.) Tul.

Traces reported from Saskatchewan in 1927.

SMUT -- Ustilago Agropyri Clinton

Traces found at Rosthern and Middle Lake, Saskatchewan in 1928.

STRIPE RUST -- Puccinia glumarum (Schm.) Erikss.

Collected at Edmonton, Alberta in 1928.

MILLET - (Setaria italica Beauv.)

BACTERIAL LEAF SPOT -- Pseudomonas sp.

Reported from Alberta in 1928: caused slight damage at Brooks and Claresholm.

Canada Blue Grass (Poa compressa L.)

POWDERY MILDEW -- Erysiphe graminis DC.

Common at Buchanan, Saskatchewan in 1927.

DISEASES OF FRUIT CROPS

APPLE

SCAB -- Venturia inaequalis (Cke.) Wint.

NOVA SCOTIA

1927 - This disease caused a serious loss to Nova Scotia orchardists.

1928 - Generally speaking, ascospore inoculum was scarcer during 1928 than in any of the three previous years. There was sufficient to cause severe injury in many sections but in some experimental orchards the scabby fruit did not exceed 30 per cent, in comparison with the previous three seasons when unsprayed trees yielded from 90 to 100 per cent scabby fruit, much of which was cracked and worthless.

NEW BRUNSWICK

1927 - Very severe especially on McIntosh and Fameuse varieties.

1928 - Quite general and severe in unsprayed orchards.

QUEBEC

1927 - Reported from Ste. Anne de la Pocatiere, St. Hilaire, Hemmingford, Mt. Johnson, Abbotsford, Rougemont, and St. Roch des Aulnais. Scab lesion on both leaves and fruit were much more severe than usual.

1928 - Reports from Kamouraska, Iberville, Quebec, and Rouville counties showed that apple scab was fairly severe. Infection varied from a trace in well sprayed orchards to 100 per cent in unsprayed orchards.

ONTARIO

1927 - Apple scab was reported from different parts of the province. In the Niagara district it was more prevalent than during the past four years.

1928 - This disease, though not so prevalent as the previous year was nevertheless quite general.

SASKATCHEWAN

- Slight infections reported from Indian Head both years.

BRITISH COLUMBIA

1927 - The exceptionally moist season of 1927 has caused a marked spread of this disease to sections of the fruit-growing areas which are usually entirely free from it, and its presence has been noted considerably farther south, that is, to the drier sections of the valley, than is usual. Many late infections on the fruit, appearing as pin-point infections at the time of picking, have caused a very considerable loss in storage.

1928 - Throughout the northern section of the valley where this disease fluctuates with the seasons, a moist autumn in 1927 saw a marked spread of scab, and the fall's forecast was borne out by the increase again apparent in the spring and summer of 1928. Growers, anticipating the spring increase, applied the recognized sprays, but often without obtaining satisfactory control. Observation, however, points to the cause of this condition as being a lack of sufficiently close adherence to the proper dates for spraying. In the southern end of the valley where the disease is practically unknown, a specimen was obtained for the first time from each of the districts of Penticton and Summerland. The later summer and fall of the present year were dry and generally favourable for scab development.

PERENNIAL CANKER -- Gloeosporium perennans Zeller & Childs

BRITISH COLUMBIA

1928 - A sufficient amount of survey work has already been carried out on the extent of this disease to show us that it is now well established in most of the orchard sections from Kelowna north, excepting Salmon Arm. Survey work on the southern Okanagan is not completed, but up to the present the canker has been found in three orchards in the Summerland district, and in two orchards in the Penticton district. The survey is being pressed forward as rapidly as possible.

APPLE

ANTHRACNOSE -- Neofabraea malicorticis (Cordley) Jackson

BRITISH COLUMBIA

1928 - There was a decided increase of anthracnose reported in the Salmon Arm district, attributable doubtless to the unusually moist season of 1927. The increase was so considerable as to cause the grower grave anxiety. In answer to many requests the laboratory at Summerland has undertaken an experimental spray programme in an endeavour to gain an effective control.

BLACK ROT -- Physalospora Malorum Shear.

NOVA SCOTIA

1927 - Reported from Middleton. Very prevalent in a few orchards.

1928 - Reported from Cornwallis, Telford, and French River. Common in old uncared-for orchards.

NEW BRUNSWICK

1927 - Slight infection in York county.

1928 - Very prevalent in the province this year. Stage on fruit and limb cankers quite rate.

MISCELLANEOUS DISEASES

CEDAR RUST -- Gymnosporangium Juniperi-virginianae Schw.

Slight occurrences reported from Ontario in 1927 and in Nova Scotia in 1928.

EUROPEAN CANKER -- Nectria galligena Bers.

Slight cases in York county, New Brunswick in 1927 and 1928.

SILVER LEAF -- Stereum purpureum

Present on many trees at Ste. Anne de la Pocatiere in 1927. Isolated cases observed in New Brunswick in 1927 and 1928.

PINK ROT -- Trichothecium roseum Link.

In 1927 a few specimens were observed in storage in York county, New Brunswick.

In 1928 it was general but not of serious consequence.

SOOTY BLOTCH -- Gloeodes pomigena (Schw.) Colby

Observed at Kentville, Nova Scotia in 1927.

LEAF SPOT -- Alternaria Mali J. W. Roberts.

In New Brunswick slight infection in isolated cases were observed in York county in 1927. The following year, however, this disease was quite prevalent in orchards in the Saint John Valley.

BROWN ROT -- Sclerotinia americana (Worm.) Nort. & Ezekiel

Slight infection reported from New Brunswick in 1927.

POWDERY MILDEW -- Podosphaera leucotricha (E. & E.) Salm.

A few restricted areas in British Columbia suffered severely in 1927. It also occurred at Metchosin, British Columbia in 1928.

COLLAR ROT

Of the orchards examined in British Columbia in 1927 many were found to be suffering heavily from the trouble. In some, the disease in some stage of development was found to occur on as many as 80 per cent of the trees in the orchard.

DROUGHT SPOT, DIE BACK, & CORKY CORE

Losses suffered from this type of disease were greatly reduced in 1927 from those of the previous season. The general improvement in the water supply throughout the Okanagan has, no doubt, had considerable influence. The losses, nevertheless, are still severe, and with many orchardists their occurrence constitutes the greatest problem which they have to face in orchard work.

Orchards growing in open types of soil, which have in the past been subject to these diseases, were, owing to the wet fall of 1927, very much freer from disease in the season of 1928. In orchards growing in a heavy type of soil, where these diseases have been severe, and where super moisture prevails, there was no decrease.

FRUIT SPOT -- Phoma pomi Pass.

A very slight occurrence of this disease was reported from York county New Brunswick in 1927.

CANKER -- Cytospora sp.

One case reported from Winnipeg, Manitoba in 1927.

BLUE MOULD -- Penicillium expansum (L.K.) Thom.

Observed in storage in New Brunswick in 1927 and 1928.

BITTER PIT

Severe in western Ontario in 1927. Also reported as common in Quebec the same year. In British Columbia it was more prevalent than usual in 1928, causing severe losses in many orchards.

FROST INJURY

Severe cases of frost injury were reported from Nova Scotia in 1927. Frost occurred on the nights of May 21st and May 23rd. Up to 8 degrees of frost was recorded in some sections. Youngest leaves showed pronounced crinkling on the upper surface. The lower surface showed necrotic areas causing puckering of the leaves. The buds, however, were not severely injured.

FLY SPECK -- Leptothyrium Pomi (Mont. & Fr.) Sacc.

This disease was very abundant on the Wagner variety in closely planted orchards in Nova Scotia in 1928.

WINTER INJURY

Severe cases of winter injury were reported from Cape Breton and Kings, Nova Scotia in 1927.

The winter of 1927-28 was kind to the orchards in British Columbia. In only a few cases was any winter injury found. Where this did occur, it was usually confined to a browning of the most recently formed bark and wood tissue, the cambium being, in practically every case, uninjured. It is probable that the moist fall of 1927 has much to do with the very favourable conditions this spring. It is possibly worthy of note that the largest crop ever produced in this valley, this year's crop, occurred after the wettest fall on record. Such is an indication of what might be expected if moisture could be properly applied to the orchards at all times during the whole year.

FIRE BLIGHT -- Bacillus amylovorus (Burr.) de Toni

Quite severe in Quebec and Ontario in both years. In the Ottawa district this disease has been very severe for the past four years.

There was a considerable increase in the amount of this disease in British Columbia in 1928 largely due to climatic conditions following the blossoming period. The infection during the blossoming period itself did not appear to be more severe than usual, but rainy weather, which followed almost immediately, served to distribute the organism widely throughout trees, where any blossom infection had occurred. As a result, severe twig and, later, limb blight developed, and the losses caused this year have been much heavier than for several years past.

CROWN ROT

BRITISH COLUMBIA

1928 - Every year more and more attention is being given by growers to this as a very serious disease. Survey work carried out this year by the laboratory staff verifies the fears of the growers as to its extent, a conservative estimate placing the annual loss at one per cent of all trees. Its continued and sometimes rapid increase in orchards, where as yet we cannot explain its cause, greatly intensifies the urgency for the investigation of this problem being pressed forward with all possible haste.

APRICOT

RUSSETTING -- Physiological ?

BRITISH COLUMBIA

- 1927 - Russetting in apricots was one of the newly met with conditions this year which did a considerable amount of damage in the orchards where it occurred. Its cause is not known, but from observational evidences it would appear to be of physiological origin.
- 1928 - This condition was again troublesome this season. Observations seem to indicate that the trouble is brought about by a condition of wet feet of the trees.

BLACKBERRY

ANTHRACNOSE -- Plectodiscella veneta (Speg.) Burk.

NEW BRUNSWICK

- 1927 - One case reported from York county.

ORANGE RUST -- Gymnoconia Beckiana (Howe) Trotter

Observed on wild blackberries in Nova Scotia and New Brunswick in 1927 and 1928. Also reported from south-western Ontario both years on cultivated blackberries.

CHERRY

SHOT-HOLE - Coccoomyces hiemalis Higgins
(Cylindrosporium hiemalis Higgins)

NOVA SCOTIA

- 1927 - Quite common on sour cherries in Canard district.
- 1928 - On June 5th, first leaf spotting was reported abundant in King's county.

NEW BRUNSWICK

- 1928 - Only a few isolated cases were reported.

ONTARIO

- 1928 - This disease was reported from different parts of the province, being very general in the Niagara peninsula. In some cases the trees were completely defoliated.

CORYNEUM BLIGHT -- Coryneum Beijerinckii Oud.

This disease was fairly abundant especially on the lower limbs at Saskatoon Saskatchewan in 1927 and 1928.

BLACK KNOT -- Dibotryon morbosum (Schw.) Theiss. & Syd.

PRINCE EDWARD ISLAND

Prevalent throughout the province on wild cherries in 1927 and 1928.

NEW BRUNSWICK

Several cases reported in 1927.

QUEBEC

1927 - This disease appeared to be very prevalent and often severe in different parts of the province. In one case in Kamouraska county twelve out of twenty trees were badly covered with the disease.

1928 - Severe cases were reported from Temiscouata, Kamouraska, and Champlain. In the latter county 25 to 30 per cent infection was reported in one orchard.

ONTARIO

Severe cases were reported in both years.

BROWN ROT -- Sclerotinia americana (Worm.) Nort. & Ezekiel

ONTARIO

1928 - Usual amount of infection reported from Lincoln county.

LEAF CURL -- Taphrina minor Sadeb.
(=Exoascus minor Sadeb.)

NOVA SCOTIA

1927 - Fairly severe cases occurred in King's county, nearly all the leaves on some branches browning and curling up.

BOTRYTIS -- Botrytis cinerea Pers.

NOVA SCOTIA

1928 - From 10 to 15 per cent infections found on both sweet and sour cherries, occurring on young green fruit about three weeks after setting. The orchard from which this case was reported had been sprayed.

CURRENT

WHITE PINE BLISTER RUST -- Cronartium ribicola Fischer

NOVA SCOTIA

1927 - Fairly common at Kentville.

1928 - Severe cases were reported from Pictou county, two thirds of the bushes being more or less defoliated.

NEW BRUNSWICK

1927 - Moderate general infections occurred in York county.

1928 - This disease was widespread on currants throughout the province.

QUEBEC

1927 - Very severe at Macdonald College, Lennoxville, and Huntingdon especially on black currants, causing premature defoliation.

1928 - Very severe infection reported from Cap Rouge.

ONTARIO

1927 - This disease was very prevalent in the Ottawa district in 1927 and 1928, being more severe on the black currants. Many badly diseased specimens were submitted by correspondents in different parts of the province both years.

SEPTORIA LEAF SPOT -- Mycosphaerella Grossulariae (Fr.)
(Septoria Ribis Desm.) Lindau

ONTARIO

- Common both years. A severe case was reported in 1928 near Toronto, York county.

SASKATCHEWAN

1927 - Severe occurrence at Indian Head.

1928 - Severe infection of lower leaves causing some defoliation at Saskatoon. This was chiefly on the black currants. The red and white currants showed very little infection.

ALBERTA

1928 - This disease was collected at Brooks but was not severe.

CURRENT
GOOSEBERRY

GLOEOSPORIUM LEAF SPOT -- Pseudopeziza Ribis Kleb.
Gloeosporium Ribis (Lib.)
Mont & Desm.

NOVA SCOTIA

1928 - A severe general infection was observed in Pictou county. Many of the bushes were almost defoliated.

NEW BRUNSWICK

1927 - A slight infection was observed in York county.

1928 - One case was reported in a city garden, Fredericton.

SASKATCHEWAN

1927 - Very common in the University garden at Saskatoon especially on the lower leaves, causing some defoliation.

POWDERY MILDEW -- Sphaerotheca Mors-Uvae (Schw.) Berk.

NEW BRUNSWICK

1927 - A slight infection occurred in York county.

1928 - A moderate infection of this disease was observed at the Dominion Experimental Station, Fredericton.

SASKATCHEWAN

1927 - In the University garden at Saskatoon 80 per cent of this year's growth was more or less severely infected.

GOOSEBERRY

WHITE PINE BLISTER RUST -- Cronatium ribicola Fischer

QUEBEC

1927 - Reported from Huntingdon. The gooseberry bushes were affected later in the season than the black currants and the infection was not so severe.

ONTARIO

1927 - Observed on wild gooseberries in the Ottawa district.

POWDERY MILDEW -- Sphaerotheca Mors-Uvae (Schw.) Berk.

NEW BRUNSWICK

1927 - A slight general infection was observed in York county.

GOOSEBERRY
GRAPE

-44-

1928 - This disease was very general but not severe.

QUEBEC

1927 - A severe case was observed at Ste. Anne de la Pocatiere, about 20 per cent of the fruits being attacked by the disease.

ONTARIO

1927 - This disease was fairly common in the vicinity of Ottawa both in 1927 and in 1928. A few specimens of the disease were also received from other parts of the province.

GLOEOSPORIUM LEAF SPOT -- Pseudopeziza Ribis Kleb.
(Gleosporium Ribis (Lib.)
Mont & Desm.)

NEW BRUNSWICK

1927 - A slight infection occurred in York county.

SEPTORIA LEAF SPOT -- Mycosphaerella Grossulariae (Fr.)
(Septoria Ribis Desm.) Lindau

SASKATCHEWAN

1927 - Light infection of this disease causing some defoliation of the lower leaves was reported from Saskatoon and Kelliher.

CLUSTER CUP RUST -- Puccinia Pringsheimiana Kleb.

NOVA SCOTIA

1927 - The early stage of this disease was observed at Middleton on June 5th; the pustules had not ruptured.

QUEBEC

1927 - A trace of this disease was found at Ste. Anne de la Pocatiere.

GRAPE

POWDERY MILDEW -- Uncinula necator (Schw.) Burr.

QUEBEC

1927 - This disease was present at Macdonald College but was of no economic importance.

DOWNY MILDEW -- Plasmopara viticola (Berk. & Curt.)
Berl. & de Toni

QUEBEC

1927 - Light infection at Macdonald College.

BRITISH COLUMBIA

1928 - Observed at Sidney.

BLACK ROT -- Guignardia Bidwellii (Ell.) Viola & Ravaz.

ONTARIO

1928 - A very severe infestation occurred in an 18 acre vineyard showing very vigorous growth and heavy foliage. No spray had been applied to the vines which were of the Concord and Niagara varieties. The disease was much worse on the vines of the latter variety.

LOGANBERRY

BACTERIAL FRUIT BLIGHT -- Bacillus desiccans Foster

BRITISH COLUMBIA

1928 - This disease was very prevalent this year in some cases upwards of 50 per cent of the fruits being blighted, causing considerable loss.

PEACH

LEAF CURL -- Taphrina deformans (Berk.) Tul.

ONTARIO

1928 - Peach leaf curl infection was quite general in the Niagara district, especially on Elbertas.

SCAB -- Gladosporium carpophilum Thüm

ONTARIO

1927 - Severe in the Niagara district. Elbertas and St. Johns were badly infected.

1928 - Twig infection was noted on two and three-year-old wood of the St. John variety.

PEACH
PEAR

-46-

BROWN ROT -- Sclerotinia americana (Worm.) Nort.&
Ezekiel

ONTARIO

1928 - The average infection was noted this year both as to twig blight and rotting of the fruit.

WILT -- Verticillium sp.

ONTARIO

1928 - This disease was reported from Niagara county. It was found involving fairly large limbs and twigs on a few trees of the South Haven variety. The Elbertas were not affected.

PEAR

FIRE-BLIGHT -- Bacillus amylovorus (Burr.) de Toni

ONTARIO

1928 - Reported from Durham county.

SCAB -- Venturia pyrina Aderh.

NOVA SCOTIA

1927 - Moderate infection reported from King's and Annapolis counties.

1928 - Slight infections on leaves and fruit of a few trees at Berwick. Severe infections on leaves and fruit in many orchards at Middleton.

NEW BRUNSWICK

1927 - Slight isolated infection observed in York county.

QUEBEC

1927 - Very severe infections (75 to 100 per cent) on unsprayed trees. Most of the fruit showed cracks in the larger lesions.

LEAF BLIGHT -- Fabraea maculata Atk.
(Entomosporium maculatum Lev.)

BRITISH COLUMBIA

1928 - Observed at Sayward.

DROUGHT SPOT OF PEAR

BRITISH COLUMBIA

1928 - A so-called drought spot condition of pears was severe in certain orchards where super moisture conditions prevail throughout the late summer months. This drought spot condition is characterized by an uneven and lumpy condition of the calyx end of the fruit and by the presence in the flesh, in the same area, of dead spots and an excessive number of stone cells.

PLUM

BLACK KNOT -- Dibotryon morbosum (Schw.) Theiss. & Syd.

NOVA SCOTIA

1928 - Reported from Hants county.

NEW BRUNSWICK

1927 - Moderate infections were observed in York county.

1928 - Generally severe on wild species but of slight occurrence on cultivated varieties.

QUEBEC

1927 - Severe in many parts of Quebec. Reports received from Montreal, Quebec, Ste. Anne de la Pocatiere, St. Basile, Mistassini, and L'Islet.

ONTARIO

1927 - This disease was of wide distribution both years and was very often severe. In the Niagara district it was much more prevalent in 1928 than usual, Reine Claude, and Lombard varieties being particularly susceptible.

PLUM POCKETS -- Taphrina Pruni Tul.

NOVA SCOTIA

1928 - This disease was of wide distribution and was very severe on Japanese varieties to which the dormant spray had not been applied. Several slight infections on partly sprayed trees were reported.

PLUM
RASPBERRY

QUEBEC

- 1928 - Quite severe in different parts of the province, in some orchards 50 to 100 per cent of the trees being affected. Reports were received from Jacques Cartier, Champlain, Kamouraska, and St. Jerome.

ONTARIO

- 1927 - This disease was present to a moderate degree both
1928. years.

SASKATCHEWAN

- 1927 - Slight infection reported from Indian Head and Verigin.

BROWN ROT -- Sclerotinia americana (Worm.) Nort. & Ezekiel

NEW BRUNSWICK

- 1927 - Moderate infections on all varieties observed in York county.
1928 - Infection was general, but not of serious consequence.

ONTARIO

- 1928 - Reported from the Niagara district.

SHOT-HOLE -- Cocomyces pruniphore Higgins
(Cylindrosporium pruniphore Higgins)

SASKATCHEWAN

- 1927 - Moderate to severe infections occurred at Indian Head.

ONTARIO

- 1928 - Infection was general in the Niagara district. A severe attack on the German Prune was observed at Queenston.

RASPBERRY

CANE BLIGHT -- Leptosphaeria Coniothyrium (Fuck.) Sacc.

NEW BRUNSWICK

- 1927 - Slight infection was reported from York county.
1928 - A slight occurrence was noted in some gardens in Fredericton.

BRITISH COLUMBIA

1928 - Reported from Elk Lake.

ANTHRACNOSE -- Plectodiscella veneta Burk.

NEW BRUNSWICK

1927 - A slight infection occurred in York county.

1928 - This disease was general but not severe.

POWDERY MILDEW -- Sphaerotheca Humuli (DC.) Burr.

NEW BRUNSWICK

1928 - Reported from one locality in York county.

ONTARIO

1928 - This disease was found to be attacking certain varieties more than others in Lincoln and Wentworth counties. The Latham variety appeared to be particularly susceptible.

SASKATCHEWAN

1928 - Found to be severely injuring the raspberries on the Illustration Farm at Guernsey.

SPUR BLIGHT -- Didymella applanata (Niessl) Sacc.

NEW BRUNSWICK

1927 - Slight infection in York county.

ONTARIO

1927 - Observed in the Ottawa district both years. Also
1928 - reported from Niagara as killing the fruit buds.
The Herbert variety appears to be very susceptible.

SEPTORIA LEAF SPOT -- Mycosphaerella Rubi Roark
(Septoria Rubi Westend.)

NEW BRUNSWICK

1927 - A moderate infection in an isolated case was observed at Grand Lake (Sunbury).

ORANGE RUST -- Gymnospora Peckiana [Howe] Trotter

NEW BRUNSWICK

1927 - Very severe on wild varieties.

1928 - This disease was quite prevalent over the entire province on wild varieties.

BRITISH COLUMBIA

1928 - Observed at Burnaby and Cobble Hill.

LATE YELLOW RUST -- Kuehneola albida Kunz | Magn.

NOVA SCOTIA

1927 - In Cambridge, King's county, 10 per cent of the new growth was affected in a plantation of the Viking variety. About 5 per cent infection was observed at Kentville.

ONTARIO

1928 - At Grimsby this disease was found attacking the lower leaves of the Viking variety.

VIRUS DISEASESMOSAIC

PRINCE EDWARD ISLAND

1927 - Mosaic was widespread in the Herbert variety, only two plantations having been certified.

NOVA SCOTIA

1928 - In King's county 10 per cent of mosaic plants were rogued from a plantation of the Viking variety.

NEW BRUNSWICK

1927 - Moderate amount of this disease of general distribution.

1928 - This disease was quite prevalent over the entire province.

QUEBEC

1928 - Very prevalent and severe in Montmorency and Kamouraska counties, infection varying from 10 to 100 per cent.

ONTARIO

- 1927 - Infection widespread involving all varieties,
1928 and causing appreciable reduction in yield.

LEAF CURL

NEW BRUNSWICK

- 1927 - A general infection of moderate degree was observed
in York county.
1928 - This disease was quite prevalent and severe in many
localities.

QUEBEC

- 1928 - On the Ile of Orleans from 2 to 100 per cent
infections were reported averaging about 30 per
cent, causing considerable reduction in yield.

ONTARIO

- 1927 - This disease was widespread in the Niagara district.
1928 Little leaf curl was observed in the vicinity of
Ottawa. When present it was usually in the Cuthbert
variety.

STRAWBERRY

LEAF SPOT -- Mycosphaerella Fragariae (Schw.) Lindau
(Ramularia Tulasnei Sacc.)

NOVA SCOTIA

- 1927 - This leaf spot was very abundant in many parts of
the province on both wild and cultivated plants. It
was very severe on light soils and on plants growing
under poor cultural conditions.
1928 - According to report from Colchester county all the
fields in that strawberry-growing district showed
100 per cent leaf infection. The crop was scarcely
more than one half this season.

NEW BRUNSWICK

- 1927 - Leaf spot was present to a moderate extent this year
but was not of economic importance.
1928 - This disease was quite prevalent throughout the
entire province.

STRAWBERRY

ONTARIO

- 1927 - Reported from different parts of the province in
1928 1927 and 1928, but did not appear to cause appreciable loss. Specimens also submitted by correspondents.

SASKATCHEWAN

- 1927 - This disease was plentiful but apparently not very injurious.

- 1928 - Fairly heavy infections reported from Saskatoon, Guernsey, and Kamsack, but little loss resulted.

ALBERTA

- 1928 - This disease was present on cultivated varieties at the University but the damage caused was negligible.

LEAF SCORCH -- Diplocarpon Earliana (Schw.) Lindau

NEW BRUNSWICK

- 1927 - Slight general infection in York county.

- 1928 - This disease was quite general and more severe this year than usual.

POWDERY MILDEW -- Sphaerotheca Humuli (DC.) Burr.

NEW BRUNSWICK

- 1927 - A slight infection was reported from York county.

- 1928 - Quite severe infections occurred in the St. John Valley and in Westmoreland county.

ONTARIO

- 1928 - Mildew was present in different parts of the province, being more prevalent in patches with heavy foliage. It was noted that Parson's Beauty and Glen Mary varieties were very susceptible.

FRUIT ROT -- Botrytis sp.

NEW BRUNSWICK

- 1927 - This rot was severe in low damp areas.

- 1928 - Only a few slight cases were recorded this year.

SASKATCHEWAN

- 1928 - At Saskatoon there were a number of light infections where the plants were thick.

STRAWBERRY
QUINCE

SASKATCHEWAN

1928 - At Saskatoon there were a number of light infections where the plants were thick.

QUINCE

RUST -- Gymnosporangium germinale (Schw.) Kern.

NOVA SCOTIA

1928 - Light infections observed in King's county on June 5th. Sori were prominent but immature.

DISEASES OF VEGETABLE AND FIELD CROPS

ARTICHOKE

WILT -- Sclerotinia

NEW BRUNSWICK

1927 - Severe in one patch in York county.

ASPARAGUS

RUST -- Puccinia Asparagi DC.

ONTARIO

1927 - Quite prevalent in the Ottawa district both years.

1928 - Light injection occurred in the Niagara district.

BEAN

ANTHRACNOSE -- Colletotrichum Lindemuthianum (Sacc.
& Magn.) Bri. & Cav.

NEW BRUNSWICK

1927 - A moderate infection occurred in York county.

1928 - This disease was worse than the preceding year being quite general and severe in different parts.

QUEBEC

1927 - At St. Nicolet (Nicolet county) 5 per cent of a field was badly affected with the diseases, while about 2 per cent of the plants showed a slight infection only. At Macdonald College it was more severe than during the previous year.

1928 - Anthracnose was quite severe in Portneuf, Quebec, and Champlain counties. The canning factories suffered much loss, and yields were greatly reduced. One variety, Petite Parisienne appeared to be resistant.

ONTARIO

1927 - This disease was very prevalent in the Ottawa district both years, especially in 1928. There were several severe cases reported from the Niagara district in 1928. In one field of the Refugee variety practically 100 per cent loss resulted.

BACTERIAL BLIGHT -- Pseudomonas Phaseoli E.F.Sm.

NEW BRUNSWICK

1927 - A slight infection occurred at the Dominion Experimental Station, Fredericton.

1928 - Only one case was observed in York county.

QUEBEC

1928 - In one field at Ste. Anne de la Pocatiere about 7 per cent of the plants were severely infected.

ONTARIO

1928 - Severe occurrence reported from Durham county. Also occurred at Ottawa.

SASKATCHEWAN

1928 - Common at Indian Head. Infection varied from a trace in Robust and Darling varieties, 5 per cent in Beauty and Norwegian to 20 per cent in Navy Pilot and 50 per cent in Navy.

ALBERTA

1928 - Moderate infections were found in gardens in Edmonton.

MOZAIC -- Virus

NEW BRUNSWICK

1927 - A slight infection was reported from York county.

1928 - General occurrence but not important.

RUST -- Uromyces appendiculatus (Pers.) Lev.

NEW BRUNSWICK

1927 - Isolated cases only observed.

WILT -- Sclerotinia Sclerotiorum (Lib.) Mass.

NEW BRUNSWICK

1927 - A slight infection occurred at the Dominion Experimental Station, Fredericton.

1928 - This disease was very severe in garden patches in York county, Injury to the extent of 60 per cent in one field of three acres.

BEET

BEET

(Including Sugar Beet & Mangel)

CERCOSPORA LEAF SPOT -- Cercospora beticola Sacc.

NEW BRUNSWICK

1927 - A moderate amount of spotting was found on the older leaves in York county.

1928 - Infection general but slight.

ALBERTA

1928 - Light infection found at Raymond.

SCAB -- Actinomyces scabies (Thax.) Güssow

NEW BRUNSWICK

1928 - One case reported from a city garden in Fredericton.

QUEBEC

1928 - Quite common in some localities in Rimouski where beets and potatoes had been planted on the same land year after year.

ONTARIO

1927 - Moderate infection occurred in a field in Middlesex county in which scabby potatoes had formerly been produced.

1928 - One case observed at Ottawa.

ROOT ROT -- Phoma sp.

ALBERTA

1928 - Quite severe causing 20 per cent damage in some field. The base of the root is affected with black or dark brown rot. Leaves flagging and petioles often blackened. Found in sugar beets and mangels in irrigated field, especially those in poor physical condition.

ROOT ROT -- Rhizoctonia sp.

ALBERTA

1928 - This disease was destructive in irrigated fields at Raymond. Young beets were affected, the upper part of the root being girdled and the plants stunted.

SOFT ROT -- Bacillus carotovorus Jones

NEW BRUNSWICK

- 1927 - A slight outbreak was observed both 1927 and 1928
1928 at the Dominion Experimental Station at Fredericton.

CABBAGE

CLUB ROOT -- Plasmodiophora Brassicae Wor.

NEW BRUNSWICK

- 1927 - A moderate infection was found on young plants in York county.
1928 - One light case was reported from Sunbury.

QUEBEC

- 1927 - In a field in Temiscouata county about 5 per cent of the plants were severely attacked.
1928 - Very severe in gardens on the Magdalen Islands, being found in about 70 per cent of them.

BRITISH COLUMBIA

- 1928 - A severe outbreak occurred in the Armstrong district, the disease being new to this section. A survey showed that over 50 per cent of the acreage was affected and in over 70 per cent of this area, from 90 to 100 per cent of all plants were affected.

BLACK ROT -- Pseudomonas campestris (Pamm.) E.F.Sm.

ONTARIO

- 1928 - A very severe case was reported from Humberstone in York county. About 80 per cent of the crop was destroyed.

SOFT ROT -- Bacillus carotovorus

NEW BRUNSWICK

- 1927 - Slight infection occurred in York county.
1928 - Infection general but usually slight. Only one serious case was reported.

DROP -- Sclerotinia Sclerotiorum (Lib.) Mass.

QUEBEC

1927 - Three heads of cabbage very severely affected were found at Ste. Anne de la Pocatiere.

1928 - A few badly affected specimens were again found at Ste. Anne de la Pocatiere, but the disease was not common this year.

BLACK-LEG -- Phoma lingam (Tode) Desmazieres

One case reported from New Brunswick in 1927.

WIRE STEM -- Corticium vagum B.&C.

One case reported from a garden in Edmonton, Alberta, in 1928.

DAMPING OFF -- (Caused by various fungi).

One case reported from the province of Quebec in 1927.

CARROT

WILT -- Sclerotium Sclerotiorum (Lib.) Mass.

A slight infection was observed in York county, New Brunswick in 1927.

CAULIFLOWER

CLUB ROOT -- Plasmodiophora Brassicae Wor.

NOVA SCOTIA

1927 - One slight case reported near Halifax.

NEW BRUNSWICK

1927 - Slight infections in young plants were observed in York county.

1928 - Infections were general but slight in the same county.

BRITISH COLUMBIA

1928 - Severe infections reported from the Armstrong district.

BLACK ROT -- Pseudomonas campestris (Pann.) E.F.Sm.

ONTARIO

1928 - A very severe case was reported from Humberstone in York county. About 80 per cent of the crop was destroyed.

SOFT ROT -- Bacillus carotovorus Jones

NEW BRUNSWICK

1927 - Isolated cases reported from York county.

1928 - Only one slight case observed.

CHINESE CABBAGE (Brassica pekinensis)

CLUB ROOT -- Plasmodiophora Brassicae Wor.

BRITISH COLUMBIA

1928 - This plant was severely attacked in the Armstrong district. It is believed that this is the first record of this host being attacked either in Canada or in the United States.

CELERY

LATE BLIGHT -- Septoria Apii Chester

NEW BRUNSWICK

1927 - Severe cases occurred in York county causing partial defoliation.

1928 - Infections general but slight in York county.

QUEBEC

1928 - All celery near Montreal was badly infected with late blight. One field showed 70 to 80 per cent loss.

ONTARIO

- 1927 - Reported from different parts of the province
1928 both years. Heavy infestations in the Ottawa district in 1928.

EARLY BLIGHT -- Cercospora Apii Fr.

QUEBEC

- 1928 - Several cases were reported from the Agricultural School and the Experimental Farm at Ste. Anne de la Pocatiere. Infections, however, were not severe.

SLIME MOULD -- Physarum cinereum (Batsch.) F.

ONTARIO

- 1927 - A very interesting case of a slime mould over-running celery was observed this past season. About two dozen celery plants out of several hundred, growing under unusually moist conditions in a cold frame, were over-run by a slime mould which was later identified as Physarum cinereum (Batsch.) P. in two or three cases the celery plants were almost completely suffocated by the slime mound, and the plants eventually died. On the whole, however, little damage was done.

BACTERIAL SOFT ROT -- Bacillus carotovorus Jones

ONTARIO

- 1927 - Several cases of loss in storage were reported from western Ontario.
1928 - A heavy infestation was reported from Middlesex county.

YELLOWIS?-- Fusarium sp.

ONTARIO

- 1928 - One small area in a patch of celery in Grantham township, Lincoln county was suspected of being affected by Fusarium "Yellows".

CRESS

DOWNY MILDEW -- Peronospora parasitica (Pers.) De Bary

SASKATCHEWAN

1927 - A fairly heavy infection was observed in a small garden in Saskatoon.

CUCUMBER

SCAB -- Cladosporium cucumerinum Ell. & Arth.

QUEBEC

1927 - This disease was found in the vicinity of Beauport about 3 per cent of the cucumbers being infected.

1928 - In a field comprising one quarter acre, about 12 to 15 per cent loss was caused by this disease, being much worse than during the previous year.

BACTERIAL WILT -- Bacillus tracheiphilus E.F.Sm.

NEW BRUNSWICK

1927 - Slight infection was reported from York county.

1928 - This disease was quite severe in the garden section on the east side of the St. John River.

RUST -- Fusarium sp.

One case was reported from York county New Brunswick in 1928.

ANGULAR LEAF SPOT -- Pseudomonas lachrymans (Sm. & Bryan) Carsn.

NEW BRUNSWICK

1928 - A few isolated cases were reported from Sunbury, St. John valley.

QUEBEC

1928 - Only one case recorded for this province, being submitted by a correspondent.

MOSAIC -- Virus

A few cases were observed in York county, New Brunswick in 1927.

CELERY
ONION

-62-

HORSE RADISH

LEAF SPOT -- Ramularia Armoraciae Fekl.

A slight infection occurred in York county, New Brunswick in 1927.

LETTUCE

DROP -- Sclerotium Sclerotiorum (Lib.) De Bary.

NEW BRUNSWICK

1927 - Moderate infections observed in older plants in York county.

1928 - Quite prevalent in the St. John valley.

GREY MOULD -- Botrytis cinerea Pers.

NEW BRUNSWICK

1927 - Severe cases were observed in damp locations in York county.

BACTERIAL ROT -- Bacillus carotovorus Jones

ONTARIO

1927 - Reported from Todmorden, York county.

ONION

DOWNY MILDEW -- Peronospora Schleideni Unger

NEW BRUNSWICK

1927 - This disease was generally present in Sunbury county and proved a considerable factor in onion production in this area.

1928 - This disease was quite serious this year on the east side of the St. John river.

QUEBEC

1927 - There was a very high infection at Macdonald College. In two fields practically every plant was attacked, the yield being reduced considerably. Both the red and the white varieties were attacked equally severely. The white ones succumbed first however.

ONTARIO

- 1928 - This disease was fairly prevalent in a plantation in Lincoln county near St. Catharines. The disease attacked the white varieties more severely than the red ones.

SASKATCHEWAN

- 1927 - A moderate infection was observed in the garden at the Experimental Farm at Indian Head.

NECK ROT -- Bettrytis Alii Mann.

NEW BRUNSWICK

- 1927 - Only one specimen observed in York county.

ONTARIO

- 1928 - One plantation badly diseased in the vicinity of Prescott.

BRITISH COLUMBIA

- 1927 - The early and excessive fall rains contributed greatly in causing the large amount of neck-rot which occurred this year. Practically the whole crop grown on the upper bench lands in the Kelowna district was a total loss. It is estimated that approximately 2,000 tons of onions were not even removed from the fields.

- 1928 - Neck-rot is the most serious disease confronting the onion growers of the Okanagan valley. Its severity is dependent largely on climatic conditions prevailing during the late growing season and during the harvesting and field during period. An exceptionally favourable autumn this year enabled the growers to harvest their crop with practically no loss. It is worthy of note, however, that, in a few sections on the upper bench lands, even under such favourable climatic conditions, heavy losses again occurred. In these areas the disease becomes so thoroughly established in the crop before it is pulled, that favourable harvesting weather is of no avail in preventing the loss. It would seem, therefore, that such areas are not suitable for the growing of this commodity.

ONION
PARSNIP
PEA

-64-

BULB ROT -- Fusarium sp.

BRITISH COLUMBIA

1927 - A survey has shown that this disease occurred in approximately one-half of the onion acreages in the Kelowna district. Throughout the affected area, losses varied greatly, running from 1 to 60 per cent. An estimate over the whole area indicated that possibly 5 per cent of all the bulbs in this area were affected.

1928 - The survey carried out this year shows that this disease is now widespread throughout the main onion growing sections. It is more severe on the lower lying lands, but was found this year on the higher levels. Where it has been longest established, it is now so severe that it is discouraging the growing of the crop.

SMUT -- Urocystis Cepulae Frost

ONTARIO

1928 - Observed in Lincoln county infecting young seedlings.

PARSNIP

LEAF SPOT -- Ramularia pastinacea Bubak

NEW BRUNSWICK

1927 - A moderate infection was reported from York county.

1928 - Only one case was observed in the same locality as in the preceding year.

PEA

POWDERY MILDEW -- Erysiphe Polygoni DC.

NEW BRUNSWICK

1927 - A slight infection was reported from York county.

QUEBEC

- 1928 - At Ste. Anne de la Pocatiere a very severe case was reported, the peas in the garden being covered with the fungus.

BRITISH COLUMBIA

- 1928 - Reported from Victoria.

LEAF AND POD SPOT -- Ascochyta Pisi Lib.

SASKATCHEWAN

- 1927 - This disease was quite severe. Considerable injury was caused to stems and pods. Infection occurred on land which was flooded during part of the early growing season.

- 1928 - Infections were very light at Rosthern but heavy at Saskatoon.

BRITISH COLUMBIA

- 1928 - Reported from Sidney.

MOSAIC -- Virus

NEW BRUNSWICK

- 1928 - Light infections in isolated cases observed in York county.

POTATO INSPECTION AND CERTIFICATION

Acreage Entered for Inspection

A total of 31,601 acres of potatoes was entered for field inspection with a view to certification, in 1927. This is an increase of approximately 18,000 acres, or 130 per cent over the acreage inspected in 1926.

In 1928 a total acreage of 40,497 was entered for field inspection. This represents an increase of 8,896 acres, approximately 28 per cent more than was entered for inspection in 1927, the previous record year. In spite of the large increase in acreage entered for inspection in 1928, the percentage which passed to our standard was also higher, 77.8 compared with 75.6 in 1927.

Year	Number of fields inspected	Number of acres inspected	Number of fields passed	Number of acres passed	Percentage of fields passed	Percentage of acres passed
1921	2,646	7,900.0	1,634	4,290.0	61.7	54.3
1922	3,283	11,250.0	2,139	6,991.0	65.3	62.1
1923	2,914	9,681.0	2,061	7,099.7	70.7	73.3
1924	5,586	19,238.87	3,868	13,916.64	69.25	72.3
1925	4,542	14,451.51	3,307	10,856.88	72.8	75.1
1926	4,212	13,714.57	3,094	10,392.61	73.5	75.8
1927	8,388	31,601	6,125	23,875	73.0	75.6
1928	9,610	40,497	7,156	31,509	74.5	77.8

Summary of the Field Inspection Work by Provinces 1927.

Province	Number of applica- tions	Number of fields inspected	Number of fields passed	Per- centage	Number of acres inspected	Number of acres passed	Per- cent- age.
Prince Edward Island . . .	4,385	5,642	4,471	79.2	24,845	19,915	80.1
Nova Scotia	248	336	185	55.0	620	377	60.8
New Brunswick	338	654	418	63.9	2,777	1,732	62.4
Quebec	319	398	261	65.6	590	385	65.3
Ontario	354	467	359	76.9	1,205	950	78.8
Manitoba	24	53	32	60.4	145	57	39.5
Saskatchewan	50	113	50	44.2	407	131	32.2
Alberta	72	115	63	54.8	250	50	20.0
British Columbia	320	610	286	46.9	762	278	36.6
Total (Canada)	6,110	8,388	6,125	73.0	31,601	23,875	75.6

Summary of the Field Inspection Work by Provinces 1928

Province	Number of applica- tions	Number of fields inspected	Number of fields passed	Per- centage	Number of acres inspected	Number of acres passed	Per- cent- age
Prince Edward Island ..	4,629	6,254	4,875	77.9	32,079	25,883	80.
Nova Scotia	214	382	251	65.7	645	425	65.
New Brunswick	470	853	536	62.8	3,540	2,276	64.
Quebec	746	807	548	68	1,107	724	65.
Ontario	420	597	453	75.8	2,043	1,480	72.
Manitoba	33	80	46	57.5	246	124	50.
Saskatchewan	60	118	84	71.2	301	199	66.
Alberta	44	82	67	81.7	100	80	80
British Columbia	197	437	296	67.7	436	318	72
Total (Canada)	6,813	9,610	7,156	74.5	40,497	31,509	77

Fields Rejected for Certification, 1927 - Reasons for Rejection

Province	Black leg	Leaf roll	Mosaic	Foreign varieties	Lack of vigour	Adjacent to disease	Lack of cultivation and insect injury	Miscellaneous #	Total Rejections	
									Fields	Acres
P.E.I.	294	6	401	154	66	78	.....	172	1,171	4,930
N.S.	11	9	26	48	.....	24	4	35	151	243
N.B.	49	7	155	8	.....	17	.....	.....	236	1,045
Que.	17	3	50	7	.....	40	8	12	137	205
Ont.	23	16	25	8	.....	27	6	3	108	255
Man.	9	1	2	3	5	1	.....	.....	21	88
Sask.	30	2	11	8	.....	9	.....	3	63	276
Alta.	22	6	11	6	2	4	1	.....	52	200
B.C.	6	....	132	22	22	89	.....	53	324	484
Totals	461	50	813	258	95	289	19	278	2,263	7,726

Includes rejections for all other reasons than those specified, viz.: Wilts, streaks, frozen down, drowned out, etc.

Field Rejected for Certification, 1928 - Reasons for Rejection

Provinces	Black leg	Leaf roll	Mosaic	Foreign varieties	Lack of vigour	Adjacent to disease	Poor cultivation and insect injury	Miscellaneous #	Total Rejections	
									Fields	Acres
P.E.I.	245	9	608	196	160	97	.....	64	1,379	6,196
N.S.	5	22	49	18	.....	13	10	14	131	220
N.B.	35	12	226	14	3	18	3	6	317	1,264
Que.	29	23	105	4	.....	84	6	8	259	383
Ont.	32	45	16	1	.....	20	16	14	144	563
Man.	8	1	13	4	.....	6	.....	2	34	122
Sask.	10	4	15	1	.....	4	.....	.....	34	102
Alta.	3	3	5	2	2	.....	.....	.....	15	20
B.C.	2	1	83	4	3	14	.....	34	141	118
Totals	369	120	1,120	244	168	256	35	142	2,454	8,988

Includes rejections for all other reasons than those specified, viz.: Wilts, streaks, frozen down, drowned out, etc.

Percentage of Disease Found - By Provinces 1927.

	P.E.I.	N.S.	N.B.	Que.	Ont.	Man.	Sask.	Alta.	B.C.
	%	%	%	%	%	%	%	%	%
Average percentage of disease in total fields inspected -									
Black leg .....	.26	.26	.6	.37	.51	1.5	1.54	1.72	.18
Leaf roll .....	.01	.3	.2	.13	.35	.04	.07	.52	.09
Mosaic .....	.43	1.5	2.5	1.23	.43	.46	.42	.93	1.94
Wilts .....	.01	.1	0	.12	0	0	0	0	.16
Average percentage of disease in fields passed -									
Black leg .....	.12	.15	.4	.11	.27	.77	.11	.21	.08
Leaf roll	Tr.	.2	.1	.07	.16	.04	.06	.06	.07
Mosaic .....	.05	.2	.4	.35	.16	.32	.13	.1	.43
Wilts	Tr.	.12	0	.09	0	0	0	0	.1
Average percentage of disease in fields rejected -									
Black leg .....	.74	.48	1.8	.88	1.3	3.22	3.53	3.55	.27
Leaf roll .....	.05	.4	.4	.23	.96	.07	.08	.55	.11
Mosaic	1.83	3.8	5.8	2.9	1.3	.62	2.15	1.8	3.27
Wilts .....	.11	.11	0	.26	0	0	0	0	.22

Percentage of Disease Found - By Provinces 1928.

Province	P.E.I.	N.S.	N.B.	Que.	Ont.	Man.	Sask.	Alta.	B.C.
	%	%	\$\$	%	%	%	%	%	%
Average percentage of disease in total fields inspected -									
Blackleg .....	.25	.08	.2	.38	.37	.73	.68	.27	.11
Leaf roll .....	.02	.32	.1	.33	.64	.39	.29	.32	.01
Mosaic .....	.60	.51	1.8	1.25	.34	.44	.65	.65	1.4
Wilts .....	.015	.32	0	.006	.002	C	0	0	.06
Average percentage of disease in fields passed -									
Blackleg .....	.13	.00	.1	.16	.24	.32	.3	.09	.07
Leaf roll .....	.01	.22	.06	.07	.3	.14	.14	.05	.003
Mosaic .....	.06	.11	.4	.31	.13	.1	.21	.14	.19
Wilts .....	.008	.15	0	.007	.002	C	0	C	.05
Average percentage of disease in fields rejected -									
Blackleg .....	.65	.11	.3	.78	.79	1.23	1.5	1.08	.23
Leaf roll .....	.04	.51	.3	.88	1.73	.72	.68	.01	.03
Mosaic	2.4	1.25	3.1	3.19	.98	.91	1.78	2.94	4.7
Wilts .....	.037	.64	0	.003	0	0	C	0	.1

Development of the Potato Certification Work.
Three-Year Period Ending 1928.

Province	Fields entered	Fields passed	Percent-age	Acreage entered	Acreage passed	Percent-age	Increase or decrease in acreage passed
P. E. Island	1926	2,300	78.3	9,275	7,597	82	%
	1927	5,642	79.2	24,845	19,915	80.1	
	1928	6,254	77.9	32,079	25,883	80.6	+240.7
Nova Scotia.....	1926	137	77.4	219	172	78.5	
	1927	336	55.	620	377	60.8	
	1928	382	65.7	645	425	65.8	+147.1
New Brunswick ...	1926	506	55.	2,031	1,195	58.8	
	1927	654	63.9	2,777	1,732	62.4	
	1928	853	62.8	3,540	2,276	64.3	+ 90.5
Quebec	1926	184	58.2	340	182	53.6	
	1927	398	65.6	590	385	65.3	
	1928	807	68.	1,107	724	65.4	+297.8
Ontario	1926	440	72.5	826	579	70.1	
	1927	467	76.9	1,205	950	78.8	
	1928	597	75.8	2,043	1,480	72.4	+155.6

Development of the Potato Certification Work.
Three-Year Period Ending 1928. (Cont'd)

Province	Fields entered	Fields passed	Percent- age	Acreage entered	Acreage passed	Percent- age	Increase or decrease in acreage passed
Manitoba	1926 1927 1928	41 32 46	68.3 60.4 57.5	146 145 246	100 57 124	68.6 39.3 50.4	+24
Saskatchewan	1926 1927 1928	71 50 84	88.7 44.2 71.2	214 407 301	103 131 199	48.1 32.2 66.2	+93.2
Alberta	1926 1927 1928	53 63 67	70.7 54.8 81.7	152 250 100	56 50 80	36.8 20. 80.	+42.9
British Columbia..	1926 1927 1928	318 286 296	74. 46.9 67.7	512 762 436	408 278 318	79.7 36.5 72.9	-22.1
Total for Canada..	1926 1927 1928	3,094 6,125 7,156	73.5 73. 74.5	13,715 31,601 40,497	10,392 23,875 31,509	75.8 75.6 77.8	+203.2

Standard 1926 - Total of 4 per cent diseased plants allowed.
1928 - Total of 3 per cent diseased plants allowed.

POTATO

LATE BLIGHT -- Phytophthora infestans (Mont.) de Bary

PRINCE EDWARD ISLAND

1927 - The earliest recorded appearance of late blight of potatoes (July 26) and its subsequent alarming development justified much concern among potato growers. Rainy weather in August favoured the development of the disease to a serious extent. Crops that did not receive the regular spray applications were destroyed and conditions threatened to cause a shortage of seed potatoes despite the enormous acreage under cultivation in the province. However, while the premature death of the plants, materially reduced the yield, actual loss through blight rot was surprisingly slight as revealed by final reports. Carefully sprayed fields produced a minimum of rotted tubers, and most of these came from the end rows where the required pressure was not maintained in turning the sprayer.

1928 - As stated above, late blight rot was abundant in 1927. As a consequence it commonly occurred that tubers, developed an incipient growth of blight rot which remained inactive throughout the winter. When cut into sets for the 1928 planting this rot, which escaped notice developed in the seed piece in the ground. Cases were noticed where sprouts were produced, but the set decayed before the plant became established.

NOVA SCOTIA

1927 - In Cumberland county several fields were too badly blighted to allow for the determination of other diseases. Considerable injury was observed in King's county where the progress of the disease was hastened by wet weather.

1928 - General in Cumberland and Colchester counties.

NEW BRUNSWICK

1927 - Late blight was very severe especially on late varieties, causing considerable loss.

1928 - This disease although quite common was less severe than during the previous season. Initial conditions in certain sections were conducive to the development of late blight in epiphytotic form, but, later in the season, changes in the weather suppressed it.

QUEBEC

1927 - Weather conditions this year were favourable for the development of late blight, a serious outbreak of which occurred causing considerable loss throughout the province except in the eastern part along the St. Lawrence.

1928 - In St. Maurice county a few vines were killed by blight in unsprayed fields, with a few tubers rotting. At Ste. Anne de la Pocatiere there was not enough rain to favour the development of late blight, and none occurred either on vines or tubers this year.

ONTARIO

1927 - There were a few local outbreaks of late blight in 1927. Some correspondents reported loss due to rot.

1928 - Late blight was severe in different parts of the province this year, especially on fields that were not sprayed or in cases where proper attention had not been given to the late season applications. In the vicinity of Ottawa a high percentage of rot was observed in Irish Cobblers while in one instance Green Mountains were 100 per cent diseased.

BRITISH COLUMBIA

1928 - Reported from Sumas Prairie.

RHIZOCTONIA -- Corticium Solani (Prill. & Del.)
Bourd. & Galz.

PRINCE EDWARD ISLAND

1927 - Very severe on late-harvested potatoes grown in infected land. Irish Cobblers 98 per cent and Green Mountains 84 per cent of tubers affected.

1928 - Tuber infection by Rhizoctonia in 1928 was never severe.

NEW BRUNSWICK

1927 - This disease varied considerably in the degree of infection, but was always a factor in production.

1928 - General and sometimes severe in York county. Slight increase over the previous year.

ONTARIO

1927 - Reported at Ottawa both years and from Durham
1928 county in 1928.

ALBERTA

1928 - This disease was very common, causing the usual amount of damage.

POTATO

LATE BLIGHT -- Phytopathora infestans (Mont.) de Bary

PRINCE EDWARD ISLAND

1927 - The earliest recorded appearance of late blight of potatoes (July 26) and its subsequent alarming development justified much concern among potato growers. Rainy weather in August favoured the development of the disease to a serious extent. Crops that did not receive the regular spray applications were destroyed and conditions threatened to cause a shortage of seed potatoes despite the enormous acreage under cultivation in the province. However, while the premature death of the plants, materially reduced the yield, actual loss through blight rot was surprisingly slight as revealed by final reports. Carefully sprayed fields produced a minimum of rotted tubers, and most of these came from the end rows where the required pressure was not maintained in turning the sprayer.

1928 - As stated above, late blight rot was abundant in 1927. As a consequence it commonly occurred that tubers, developed an incipient growth of blight rot which remained inactive throughout the winter. When cut into sets for the 1928 planting this rot, which escaped notice developed in the seed piece in the ground. Cases were noticed where sprouts were produced, but the set decayed before the plant became established.

NOVA SCOTIA

1927 - In Cumberland county several fields were too badly blighted to allow for the determination of other diseases. Considerable injury was observed in King's county where the progress of the disease was hastened by wet weather.

1928 - General in Cumberland and Colchester counties.

NEW BRUNSWICK

1927 - Late blight was very severe especially on late varieties, causing considerable loss.

1928 - This disease although quite common was less severe than during the previous season. Initial conditions in certain sections were conducive to the development of late blight in epiphytotic form, but, later in the season, changes in the weather suppressed it.

QUEBEC

1917 - Weather conditions this year were favourable for the development of late blight, a serious outbreak of which occurred causing considerable loss throughout the province except in the eastern part along the St. Lawrence.

1928 - In St. Maurice county a few vines were killed by blight in unsprayed fields, with a few tubers rotting. At Ste. Anne de la Pocatiere there was not enough rain to favour the development of late blight, and none occurred either on vines or tubers this year.

ONTARIO

1927 - There were a few local outbreaks of late blight in 1927. Some correspondents reported loss due to rot.

1928 - Late blight was severe in different parts of the province this year, especially on fields that were not sprayed or in cases where proper attention had not been given to the late season applications. In the vicinity of Ottawa a high percentage of rot was observed in Irish Cobblers while in one instance Green Mountains were 100 per cent diseased.

BRITISH COLUMBIA

1928 - Reported from Sumas Prairie.

RHIZOCTONIA -- Corticium Solani (Prill. & Del.)
Bourd. & Galz.

PRINCE EDWARD ISLAND

1927 - Very severe on late-harvested potatoes grown in infected land. Irish Cobblers 93 per cent and Green Mountains 84 per cent of tubers affected.

1928 - Tuber infection by Rhizoctonia in 1928 was never severe.

NEW BRUNSWICK

1927 - This disease varied considerably in the degree of infection, but was always a factor in production.

1928 - General and sometimes severe in York county. Slight increase over the previous year.

ONTARIO

1927 - Reported at Ottawa both years and from Durham
1928 county in 1928.

ALBERTA

1928 - This disease was very common, causing the usual amount of damage.

POTATO

EARLY BLIGHT -- Alternaria Solani (Ell. & Mart.) Jones
& Grout.

NEW BRUNSWICK

1927 - This disease varied from slight to severe in different localities.

1928 - Quite prevalent over the entire province.

ALBERTA

1928 - Collected at Brooks.

BLACK LEG -- Bacillus phytochthorus (Frank) Appel.

PRINCE EDWARD ISLAND

1927 - Black leg of potatoes was scarce even in the presence of ideal conditions for its development

NOVA SCOTIA

1927 - Black leg was present throughout the province, some fields showing as high as 11 per cent.

NEW BRUNSWICK

1927 - The loss sustained by the growers this year was slightly below the average.

1928 - Black leg was general throughout the province this year but was not of serious consequence. There was a marked decrease in the amount of disease as compared with the previous year.

ONTARIO

1927 - Several cases were reported from western Ontario, only one of which was severe.

1928 - Common in Carleton county.

SASKATCHEWAN

1928 - About 5 per cent of a garden patch was destroyed at Quill Lake.

ALBERTA

1928 - This disease was prevalent in the Edmonton district.

COLLUM SCAB -- Actinomyces scabies (Thax.) Gussow.

NOVA SCOTIA

1927 - Scab was fairly common, sometimes quite heavy infestations being found on Irish Cobblers.

POTATO

-78-

NEW BRUNSWICK

1927 - Scar was present in most stock to varying degrees.

1928 - General and often more severe than usual.

ONTARIO

1927 - This disease could generally be found in stock from infected land both years. One severe case was reported from Leeds county, the crop having been grown on clay loam fertilized with barnyard manure.

MANITOBA

1928 - One case reported by a correspondent.

ALBERTA

1928 - Common at Edmonton.

SILVER SCAB -- Spondylocoladum atrovirens Harz.

NEW BRUNSWICK

1927 - Only a slight infection reported.

1928 - General and severe in North Shore counties.

POWDERY SCAB -- Spongospora subterranea (Wallr.) Lagerh.

NEW BRUNSWICK

1927 - Only isolated cases observed.

1928 - This disease was not important, only a few cases having been reported.

DRY ROT -- Fusarium spp.

NEW BRUNSWICK

1927 - Severe under poor storage conditions.

1928 - Dry rot, though general this year, was not of serious consequence.

ALBERTA

1928 - Specimens received from Millet.

PHOMA ROT -- Phoma sp.

PRINCE EDWARD ISLAND

- 1928 - This rot was found in association with powdery scab of potatoes.

MOSAIC -- Virus

NEW BRUNSWICK

- 1927 - Severe in all localities, especially in table stock.
- 1928 - General throughout the province, while sometimes severe there was a lower percentage observed than in 1927.

QUEBEC

- 1928 - At Cap Rouge a field of Irish Cobblers showed a trace of Mosaic while a neighbouring field of Green Mountains had 7 to 10 per cent. At St. Jean (Montmorency county) a two-acre field had 35 per cent mosaic, while in a five-acre field on the same farm 75 per cent of the plants were affected.

LEAF ROLL -- Virus

NEW BRUNSWICK

- 1927 - Leaf roll was found to be present in most fields but was not the limiting factor in production as was mosaic.
- 1928 - Leaf roll was general, but conditions showed a decided improvement over the previous year.

QUEBEC

- 1928 - A field of Irish Cobblers at Cap Rouge showed 2 per cent leaf roll.

CURLY DWARF -- Virus

NEW BRUNSWICK

- 1927 - Curly Dwarf was present to a slight degree in most localities.
- 1928 - A few cases were reported from commercial fields.

POTATO
RHUBARB

-80-

SPINDLE TUBER -- Virus

NEW BRUNSWICK

1927 - There appeared to be a slight increase in the amount of this condition over 1926.

1928 - Conditions showed a decided improvement over the previous year which seems to indicate that this, as well as other diseases are yielding well to certification methods.

BRITISH COLUMBIA

1928 - Spindle tuber was observed in one lot of potatoes of the Burbank variety which had been sent to the Dominion Laboratory of Plant Pathology, Fredericton.

NET NECROSIS

NEW BRUNSWICK

1927 - Only a few cases of this trouble were observed each year; of very little importance.

HOLLOW HEART -- Non-parasitic

NEW BRUNSWICK

1927 - Less than the average amount of this condition was observed.

1928 - Only a few cases in Irish Cobblers were reported.

STREAK

NEW BRUNSWICK

1927 - This disease was quite rare in both seasons. A few
1928 isolated cases, however, were reported.

RHUBARB

LEAF SPOT -- Ascochyta Rhei E. & E.

In New Brunswick a slight infection was observed in 1927 and 1928 at the Dominion Experimental Station, Fredericton.

SPINACH

DOWNY MILDEW -- Peronospora effusa (Grev.) Rabh.

This disease was very severe in New Brunswick in 1927. One shipment was a total loss.

In Middlesex county, Ontario the disease was worse than usual in 1927. In 1928 there was a general infection in Lincoln county.

TOBACCO

BLACK ROOT ROT -- Thielavia basicola Zopf.

ONTARIO

1927 - This disease, while present in Southwestern Ontario, caused less than the usual amount of damage.

1928 - Some loss resulted in the Burley and dark-fired sections.

QUEBEC

1928 - Root rot was quite general in the cigar binder districts of Quebec owing to the cool weather conditions. The disease is so generally distributed that the almost exclusive use of Resistant Havana (No. 142) will be necessary in the future.

WILDFIRE -- Pseudomonas tabacum (W. & F.) Stev.

QUEBEC

1927 - No cases were reported outside of Yamaska valley where it was first found in 1925. Owing to the dry weather in August the damage was comparatively light. It was observed on only two farms in addition to the six on which it had first been found.

1928 - The disease was found on over thirty farms in Rouville county as compared with eight the previous year. Most of the infections were traced to one large producer of plants. One case of the disease was reported in Montcalm county north of Montreal.

LEAF SPOT -- Cercospora Nicotianae Ell. & Ev.

NEW BRUNSWICK

- 1928 - There was a quite serious outbreak at the Dominion Experimental Station, Fredericton.

ANGULAR LEAF SPOT -- Pseudomonas angulata (Froome & Murray) Stev.

QUEBEC

- 1927 - Considerable damage was caused in certain localities in this province.

- 1928 - Leaf spot was more prevalent than usual in 1928, and caused much damage.

ONTARIO

- 1928 - As in the province of Quebec this disease was more severe than usual in the tobacco growing districts where it caused considerable damage.

MOSAIC -- Virus

QUEBEC

- 1927 - This trouble was present in the Yamaska Valley in widely varying percentages on different farms. Only a few instances were noted in the L'Assomption - Montcalm district.

- 1928 - Loss from mosaic was less than usual.

ONTARIO

- 1927 - About the usual amount of mosaic was observed.
- 1928 - This trouble was much less prevalent than during the preceding years.

BRITISH COLUMBIA

- 1927 - Mosaic was very common and caused considerable damage.

DAMPING-OFF -- Pythium de Baryanum Hesse

There was considerable loss in the province of Quebec owing to faulty methods of seed-bed management.

FRENCHING -- Non-parasitic

In 1927 this trouble was more prevalent than usual in Quebec and Ontario. It was quite general in British Columbia, some fields being very seriously damaged.

About the usual amount of damage was caused in Quebec and Ontario in 1928.

SORE-SKIN -- Non-parasitic

In 1928 a single case was reported in Kent county, Ontario.

HOLLOW STALK -- Non-parasitic

A few isolated cases were observed in 1928.

LEAF DROP -- Cause unknown

This trouble, characterized by the dropping of the leaves before maturity is reached, was widespread and severe in the tobacco fields in British Columbia in both 1927 and 1928. Quite heavy losses were caused on the bottom lands in the Okanagan valley in 1928.

CURLY DWARF -- Non-parasitic

Appreciable damage was caused in British Columbia in 1927.

SUNBURN -- Non-parasitic

Burning of the leaves by the sun was fairly common in British Columbia in 1928.

LEAF SPOT -- Cause undetermined

In Quebec in 1927 various leaf spots of undetermined cause were noted, particularly on the Canelle variety, which appeared to be particularly susceptible.

TOMATO

LEAF SPOT -- Septonia Lycopersici Speg.

NEW BRUNSWICK

1927 - There was a slight scattered infection in all varieties examined.

1928 - General and quite severe.

BLACK ROT -- Alternaria Solani (Ell. & Martin) Jones
& Grout.

NEW BRUNSWICK

1927 - Heavy infections were found on the leaves, while
the fruits were only slightly affected.

1928 - There was a slight outbreak in the St. John Valley.

QUEBEC

1928 - This disease was very prevalent this year both on
the leaves and on the fruit.

DOWNY MILDEW -- Phytophthora infestans (Mont.) de
Bary

NEW BRUNSWICK

1927 - A slight infection was observed in York county.

MOSAIC -- Virus

NEW BRUNSWICK

1927 - A few cases were observed both years, but the
1928 trouble was not of any importance.

BLOSSOM END ROT -- Non-parasitic

NOVA SCOTIA

1927 - One specimen submitted by a correspondent.

NEW BRUNSWICK

1927 - Only a few cases observed.

1928 - This condition was quite severe in the greenhouse
at the Dominion Experimental Station, Fredericton.

QUEBEC

1928 - This trouble caused a heavy loss in the tomato
crop this year, especially in Rimouski and
Temiscouata counties.

ONTARIO

1928 - Blossom end rot was very common in the Ottawa
district.

YELLOWS -- Virus

BRITISH COLUMBIA

1927 - Although this disease is present every year in the
1928 southern tomato growing sections, it rarely produces heavy losses. The degree of prevalence during 1928 was considered normal.

BACTERIAL CANCER -- Bacterium michiganense (E.F.Sm.)
Stev.

BRITISH COLUMBIA

1928 - Losses were very slight this year.

BREAKDOWN -- Cause unknown

BRITISH COLUMBIA

1928 - A breakdown, occurring especially on Earliana, but also present on other varieties, was severe in the Keremeos district. The most readily recognized symptom of the disease was the occurrence in the fruit, just about ripening time, of soft, mushy areas in the tissue lying just underneath the epidermis. These areas, usually occurring towards the calyx end of the fruit had a water soaked appearance and the colour was often slightly redder than that of neighbouring unaffected portions. To the touch, these areas were soft and watery and, when the epidermis was broken through with the finger, the tissue ran out in a water stream. Badly affected fruits were almost useless for canning, since so much of the tissue was lost in peeling. The trouble occurred under practically all conditions of culture, and was generally present throughout the whole district. It is true that, under certain fertilizer treatments, the disease was not as prevalent as in fields or parts of fields where the fertilizer was not applied. Its presence, however, in every field would seem to indicate that some condition, other than lack of food materials in the soil, was actually responsible for the trouble. The fertilizer treatments perhaps only prevented the actual causal factors from producing the losses that occurred on less vigorous plants. A protracted period of hot days and cold nights - 100° F. for five successive days, with sudden drops at night - might have played a very definite role in producing such a trouble.

TURNIP

CLUB ROOT -- Plasmodiophora Brassicae Wor.

NOVA SCOTIA

- 1928 - Two severe cases were reported from Colchester county.

NEW BRUNSWICK

- 1927 - Club root varied in intensity in different fields but was seldom severe.

- 1928 - This disease was generally severe this year.

QUEBEC

- 1927 - In a two-acre field in Nicolet county 20 per cent of the plants were badly affected. A one-acre field on the Magdalen Islands showed at least 50 per cent infection.

RHIZOCTONIA -- Corticium Solani (Prill. & Del.)
Bourd. & Galz.

NEW BRUNSWICK

- 1927 - Only one specimen was observed.

- 1928 - General but slight infection.

LEAF SPOT -- Cercospora albo-maculans (Ell. & Ev.)
Sacc.

NEW BRUNSWICK

- 1927 - This disease was found in St. Mary's, York county. It was sufficiently severe to cause the death of numerous leaves on the plants.

- 1928 - Leaf spot was more general in distribution than in 1927 and the infections were severe.

DRY ROT -- Phoma Lingam (Tode) Desm.

QUEBEC

- 1928 - In Bonaventure county two fields had 50 and 65 per cent dry rot respectively. The former was on wet soil and the latter on dry soil. The seed from which these two fields were grown, as well as another affected field in Beauce county, was all from the same source.

POWDERY MILDEW -- Erysiphe Polygoni DC.

NOVA SCOTIA

- 1928 - This disease was prevalent on the variety plots at the Dominion Experimental Station, Kentville, but was not a serious factor.

DOWNY MILDEW -- Peronospora parasitica (Pers.) de Bary

NEW BRUNSWICK

- 1927 - Isolated infections were found in York county.

SCAB -- Actinomyces scabies (Thax.) Güssow

QUEBEC

- 1928 - Scab was quite common on turnips in some localities, because potatoes and beets had been planted on the same land for years.

DISEASES OF FOREST AND SHADE TREES

BALSAM FIR (Abies balsamea (L.) Mill.

WITCHES' BROOM RUST -- Melampsorella elatina (Alb. & Schw.) Arth.

Occasional occurrences were reported from Nova Scotia and New Brunswick in 1927 and 1928.

BEECH (Fagus grandifolia Ehrh.)

LEAF BLIGHT -- Gnomonia sp.

Perithecial stage found in King's county, Nova Scotia in 1927.

BIRCH (Betula spp.)

HEART ROT -- Fomes igniarius Fr.

Commonly present in many localities in New Brunswick in 1927 and 1928.

ANTHRACNOSE -- Gloeosporium betulosum Ell. & Mart.

One case reported from St. John county, New Brunswick in 1928.

LEAF SPOT -- Phyllosticta Betulae Ell. & Ev.

One case observed in York county, New Brunswick in 1928.

BUTTERNUT (Juglans sp.)

LEAF SPOT -- Marssonina juglandis (Lib.) P. Magnus

This disease was quite general in the St. John Valley in Sunbury county, New Brunswick, 1928.

BOX WOOD (Buxus sempervirens Thumb.)

ANTHRACNOSE -- Gloeosporium Louisiae, Bauml?

Caused defoliation of a small tree in London, Ontario in 1928.

The following were also reported from London, Ontario.

Volutella Buxi (Cda.) Berk.

Verticillium Buxi (Link) Awd. & Fleisch.

Blennomia Buxi Fr.

Macrophoma Candollii (B. & Fr.) Berl. & Vogl.

CHESTNUT (Castanea dentata (Marsh.) Borkh.)

BLIGHT -- Endothia parasitica (Murr.) And.

According to reports from Welland county in 1928, this disease caused the death of many chestnut trees in the vicinity of Fenwick.

ELM (Ulmus americana L.)

LEAF SPOT -- Gnomonia ulmea (Sacc.) Thüm.

Slight infections occurred in New Brunswick in 1927 and 1928.

HEART ROT -- Fomes igniarius Fr.

Several cases of Heart Rot reported from New Brunswick in 1927 and 1928.

HAWTHORN (Crataegus sp.)

POWDERY MILDEW -- Phyllactinia corylea (Pers.) Karst.

Reported from Metchosin, British Columbia in 1928.

MAPLE (Acer)

TAR SPOT -- Rhytisma acerinum (Pers.) Fr.

Light infections were reported from York county, New Brunswick, in 1927 and 1928.

WILT -- Verticillium sp.

Reported as being quite severe in maple trees (Acer saccharum L., and Acer rubrum L.) used for shade and ornamental purposes at Fredericton, New Brunswick in 1928.

POWDERY MILDEW -- Uncinula circinata Oke. & Pk.

Reported from Victoria, British Columbia.

ANTHRACNOSE -- Gloeosporium apocryptum Ell. & Ev.

Reported from Chatham, Ontario in 1927 (Acer platanoides L.).

CANKER -- Nectria cinnabarina (Tode) Fr.

Observed at Ottawa on Acer platanoides L., in 1928.

OAK (Quercus)

LEAF BLIGHT -- Gloeosporium nervisequum (Eckl.) Sacc.

This disease was very common in the vicinity of Ottawa in 1927 due to the excessive rain in May and June. It appeared to be confined to the White Oak (Quercus alba L.). It also caused premature defoliation at Senneville, Quebec, the white oaks being especially severely attacked.

PINE (Pinus)

WHITE PINE BLISTER RUST -- Cronartium ribicola Fisch.

Isolated cases were reported from Nova Scotia and New Brunswick in 1927 and 1928. One diseased tree found on private grounds at Ottawa in 1927.

POPLAR (Populus)

MILDEW -- Uncinula Salicis (DC.) Wint.

Slight infection reported from Indian Head, Saskatchewan in 1927.

LEAF SPOT -- Septoria populicola Peck.

Fairly heavy infections were observed in certain groves of Populus balsamifera L. at Saskatoon, Saskatchewan in 1928.

HYPOXYLON CANKER -- Hypoxylon pruinatum (Klotzsch) Cke.

This disease was responsible for the killing of several trees at Annaheim, Saskatchewan, in 1928.

SPRUCE (Picea)

RUST -- Melampsoropsis ledicola (Pk.) Arth.

Reported from Kanora, Ontario, and from Jasper Park, Alberta in 1927.

LEAF RUST -- Chrysomyxa Weirii Jackson

A severe infestation was reported from Manitoba in 1928.

WILLOW (Salix)

BLIGHT -- Fusicladium saliciperdu (All. & Tub.)
Lind. and Physalospora Miyabeana Fukushi

This disease was exceedingly widespread in the Maritime Provinces and Quebec in 1927 and 1928 and caused severe damage.

TAR SPOT -- Rhytisma salicinum Fr.

Isolated infections were observed in New Brunswick in 1927 and 1928.

RUST -- Melampsora Bigelowii Thüm.

Light infections were reported in 1928 from King's county, Nova Scotia, St. Gregor, Saskatchewan, and Point Grey, British Columbia.

POWDERY MILDEW -- Uncinula Salicis (DC.) Wint.

Moderate to heavy infections were reported from Indian Head and Prudhomme, Saskatchewan in 1928.

HEART ROT -- Fomes ignarius Fr.

Several cases observed in some very old trees in York county, New Brunswick.

DIE BACK -- Valsa sp.

In certain years considerable dying back of the younger limbs appears to be due to this fungus at Saskatoon. Reported in 1927.

DISEASES OF ORNAMENTAL PLANTS

ASTER

WILT -- Fusarium conglutinans Woll.
var. Callestephi Beach

This disease was very severe in New Brunswick, Quebec, and Ontario in 1927 and 1928. In some beds 75 per cent of the plants were attacked while others were entirely wiped out.

YELLOW

One report from King's county Nova Scotia.

AZALEA

LEAF GALL -- Exobasidium Vaccini (Fekl.) Wor.

Specimen received from Braeside, Ontario in 1928.

BARBERRY

RUST -- Puccinia graminis Pers.

An abundance of aecia reported from Colchester and King's counties, Nova Scotia, 1928. It was also observed on the barberry bushes at Ottawa in 1928.

BLEEDING HEART

WILT -- Sclerotinia sp.

One specimen observed in York county New Brunswick in 1928.

BUCKTHORN

RUST

Reported from Nova Scotia, Quebec, and Ontario in 1928.

CARAGANA

LEAF SPOT -- Septoria Caraganae (Jacz.) P.Henn.

Severe cases were reported from Indian Head and Saskatoon, Saskatchewan in 1928.

CARNATION

LEAF SPOT -- Alternaria Dianthi F.L. Stevens

A slight infection was reported from York county, New Brunswick in 1927. It also occurred at London, Ontario in the same year. In 1928 the disease was quite serious in garden patches at Fredericton, New Brunswick.

RUST -- Uromyces Dianthi (Pers.) Niessl.
(= Uromyces caryophyllinus (Sch.) Wint.)

General infections, though slight, were reported from York county, New Brunswick in 1928. The disease was also severe in greenhouse stock at Ottawa in 1928. There was considerable variation in the susceptibility of varieties.

CENTAUREA

RUST -- Puccinia Cyani Pass.

This rust was destructive on cornflower at London, Ontario in 1927.

CLARKIA

WILT or STEM ROT -- Botrytis sp.

One specimen affected with this disease was observed in York county, New Brunswick.

COLUMBINE

POWDERY MILDEW -- Erysiphe Polygoni DC.

A moderate infection appeared on most plants examined in York county in 1927 and 1928.

LEAF SPOT -- Alternaria sp.

A slight infection was observed in York county.

DAHLIA

STORAGE ROT -- Botrytis sp. and Pinotes sp.

Both these organisms were found to be associated with a rot which appeared at Macdonald College, Quebec, in tubers which had been stored in sand which was slightly damp.

LEAF SPOT -- Phoma Dahliae Berk.

Considerable leaf spot and blossom blight was reported from Kentville and Hantsport.

DELPHINIUM

POWDERY MILDEW -- Erysiphe Cichoracearum DC.

This disease was severe on practically all plants examined in York county in 1927 and 1928. It was also reported from Ontario and Alberta in the latter year.

BACTERIAL BLIGHT -- Pseudomonas Delphinii (E.F.Sm.)
Stapp

Reported from Parry Sound, Ontario in 1928.

GERANIUM

STEM ROT -- Bacterium Erodii Lewis

There was a very severe infestation of this trouble in propagation beds in a nursery in King's county, Nova Scotia in 1927.

GLADIOLUS

LEAF SPOT -- Septoria Gladioli Pass.

Several cases reported from New Brunswick and Ontario in 1927 and 1928.

GLADIOLUS
HOLLYHOCK

-96-

DAY ROT -- Sclerotium Gladioli Massey

Several cases were reported from Ontario in 1927 and 1928. One case was reported from New Brunswick in 1928.

BLIGHT -- Bacterium marginatum McCulloch

Reported from Ontario, Manitoba and British Columbia in 1927. Several reports from Ontario in 1928.

HOLLYHOCK

RUST -- Puccinia Malvacearum Bert.

Hollyhock rust was widespread and severe in Nova Scotia, New Brunswick, Quebec, and Ontario in 1927 and 1928.

WILT -- Sclerotinia sp.

This disease was moderate in New Brunswick in 1927. In 1928 a serious outbreak occurred at the Dominion Experimental Station, Fredericton.

HYACINTH

YELLOW DISEASE -- Pseudomonas Hyacinthi (Wakk.)
E.F.Sm.

One case reported from Toronto, Ontario.

IRIS

LEAF SPOT -- Didymellina macrospora Kleb.
Heterosporium gracile Sacc.

Reported from New Brunswick, Quebec, and Ontario in 1927 and 1928.

LILAC

LEAF SPOT -- Phyllosticta Halstedii E. & P.

One report from Quebec.

POWDERY MILDEW -- Microsphaera Alni (Wallr.) Salm.

Moderate infections were reported from Nova Scotia in 1927 and from New Brunswick and Ontario in 1927 and 1928.

LILY

BLIGHT -- Botrytis elliptica (Berk.) Cke.

One case was reported from Durham county, Ontario in 1927.

NARCISSUS

SMOULDER -- Botrytis narcissicola Kleb.

Reported from Seamsville, Ontario in 1927 and from British Columbia in 1928.

PANSY

ANTHRACNOSE -- Colletotrichum tricoloris R.E.Sm.

Slight infections were reported from Nova Scotia in 1927.

LEAF SPOT -- Alternaria sp.

Slight infections occurred in York county, New Brunswick in 1927 and 1928.

PEONY

BLIGHT -- Botrytis Paeoniae Oud.

Severe cases were reported from Nova Scotia, New Brunswick, Quebec, and Ontario in 1927 and 1928. One report was received from Manitoba in 1928.

WINTER INJURY

There was considerable winter injury at the Dominion Experimental Station in 1928.

PHLOX

POWDERY MILDEW -- Erysiphe Cichoracearum DC.

Severe cases occurred in Ontario and Quebec in 1927 and 1928.

ROSE

BLACK SPOT -- Diplocarpon Rosae Wolf.
(Actinonema Rosae (Lib.) Fr.)

Severe in New Brunswick, Quebec, and Ontario in 1927 and 1928 sometimes causing premature defoliation.

RUST -- Phragmidium speciosum (Fr.) Cke.

In New Brunswick rust was slightly prevalent in 1927, but was quite severe in gardens at Fredericton in 1928. In Quebec it was severe at Macdonald College and in gardens at Senneville. Occasional cases were observed at Ottawa in 1927 and 1928. The disease was common on both wild and cultivated roses at Edmonton in 1928 and was also reported from Swift Current, Saskatchewan the same year.

POWDERY MILDEW -- Sphaerotheca pannosa (Wall.) Lev.

Common in Quebec and Ontario in 1927 and 1928. Also found on house plants at Edmonton, Alberta in 1928.

LEAF SPOT -- Cercospora rosicola

Occurred at Guelph in 1927.

CROWN GALL -- Pseudomonas tumefaciens (Sm. & Towns.)
Dugg.

One case reported from Saskatoon, Saskatchewan in 1928.

SNAPDRAGON

RUST -- Puccinia Antirrhini Diet. & Holw.

Moderate infections were reported from New Brunswick in 1927. Severe cases were reported the following year from New Brunswick, Quebec and Ontario.

ANTHRACNOSE -- Colletotrichum Antirrhini Stewart

One report received from Quebec in 1927.

STOKESIA

BLIGHT -- Botrytis sp.

Reported from Cornwall, Ontario in 1928.

SWEET PEA

POWDERY MILDEW -- Microsphaera diffusa Cke. & Pk.

General infections slight to moderate in severity were reported from York county, New Brunswick in 1927 and 1928.

MOSAIC -- Virus

Isolated specimens were observed in York county, New Brunswick in 1928.

BUD DROP -- Physiological.

A few isolated cases were observed in York county, New Brunswick in 1928.

TULIP

BLIGHT -- Botrytis Tulipae (Lib.) Lind.

Reported from points in Ontario in 1927 and 1928; also from Saskatchewan in 1928.

GREY BULB ROT -- Rhizoctonia Tuliparum (Kleb.)
Mietz. & Arth.

One case reported from New Brunswick in 1927.

FUSARIUM BULB ROT -- Fusarium sp.

In September 1927, specimens of rotted tulip bulbs were received at the Summerland Laboratory from Creston, British Columbia, where it was reported that the trouble was causing considerable losses. Isolations from the rotted tissue consistently gave a Fusarium species which when reinoculated into healthy bulbs was capable of producing a rot similar in all respects to that which occurred on the tulips sent in from the field. As in available check lists on plant diseases, no Fusarium bulb-rot of tulips is reported, this opportunity is taken of drawing attention to this new disease. The trouble is characterized by a number of rotted areas occurring on the outer fleshy scale of the tulip bulb. The areas are somewhat sunken, soft and mealy in texture, dark brown in colour on the outside, shading to light underneath. Outside the distinct margin of the rot, a yellow discolouration was present in the apparently still unaffected tissue.

VACCINIUM

LEAF GALL -- Exobasidium Vaccinii (Fekl.) Wor.

Reported from Ste. Anne de la Pocatiere, Que.

VIOLET

RUST -- Puccinia Violae (Schum.) DC.

Common on wild species in New Brunswick.

LEAF SPOT -- Alternaria Violae

Very severe in greenhouse at Macdonald College, Quebec.

VINCA

RUST -- Puccinia Vincae

Plants in a greenhouse at Ottawa were heavily infected in 1928.

DISEASES OF MISCELLANEOUS PLANTS

- Agropyron repens (L.) Beauv.
Claviceps purpurea (Fr.) Tul. Quebec 1927
 Quebec 1928
- Puccinia graminis Pers. Nova Scotia 1927
 Nova Scotia 1928
 New Brunswick 1927
- Agropyron Smithii Rydb.
Claviceps purpurea (Fr.) Tul. Saskatchewan 1928
- Agrostis stolonifera Host
Puccinia graminis Pers. Nova Scotia 1927
- Agrimonia gyrosepala Wallr.
Pucciniastrum Agrimoniae Nova Scotia 1927
- Amelanchier spicata (Lam.) C. Koch
Dimerisporium Collinsii (Schw.) Thüm ... Alberta 1927
 Alberta 1928
- Amelanchier canadensis (L.) Medic.
Gymnosporangium germinale Kern. Nova Scotia 1927
- Amaranthus retroflexus L.
Albugo Bliti (Bir.) Kze. Alberta 1928
- Capsella Bursa-pastoris (L.) Medic.
Cystopus caninus (P.) Lev. Quebec 1927
Peronospora parasitica (P.) Tul. Saskatchewan 1927
- Chamaesyce glyptosperma (Englm.) Small
Uromyces procumbens (DC.) Lev. Saskatchewan 1927
- Chenopodium album L.
Peronospora effusa (Grev.) Rabh. Saskatchewan 1927
 Saskatchewan 1928
- Cirsium arvense L.
Puccinia suaveolens (Pers.) Rostr. New Brunswick 1927
 New Brunswick 1927
 Quebec 1927
- Cornus canadensis
Puccinia acuminata Peck. Nova Scotia 1927
- Elymus innovatus Beal.
Claviceps purpurea (Fr.) Tul. Saskatchewan 1928

- Hordeum jubatum L.
Rhynchosporium secalis (Heins.) Davis ... Alberta 1928
Ustilago Lorenziana Tadm. Saskatchewan 1928
Puccinia glumarum (Schm.) Erikss. & Henn. Alberta 1928
- Lepidium sp.
Peronospora parasitica (Pers.) de Bary ... Saskatchewan 1928
- Leontodon sp.
Puccinia Hieracii (Schum.) Arth. Saskatchewan 1928
- Lathyrus venosus Muhl.
Uromyces Lathae (Pers.) de Bary Saskatchewan 1928
- Lingustrum vulgaris
Gnomoniopsis singulata Stoneman Ontario 1928
- Lacinaria punctata (Hook.) Kuntze
Puccinia Liatrisis Bethel I Saskatchewan 1928
- Limonium carolinianum (Walt.) Britton
Uromyces Limonii Nova Scotia 1928
- Norta altissima (L.) Britt.
Albugo candida (Pers.) Roussel Saskatchewan 1928
- Oligoneuron canescens Rydb.
Puccinia Stimpae (Opiz.) Arth. I Saskatchewan 1928
- Portulacca oleracea L.
Albugo Portulaccae (DC.) Kze. Saskatchewan 1928
- Potentilla sp.
Phragmidium Potentillae (Pers.) P. Karst. II & III
 Saskatchewan 1927
- Potentilla sp.
Mycochaerella sp. New Brunswick 1928
- Rubus melanolasius Focke
Phragmidium imitans Arth. III. Saskatchewan 1928
- Rosa sp.
Phragmidium americanum II & III. Nova Scotia 1928
- Rubus sp.
Gymnosporia Peckiana (Howe) Trotter Nova Scotia 1928
- Sisimbrium altissimum L.
Albugo candida (Pers.) Roussel Alberta 1928

<u>Steironema ciliatum</u> (L.) Raf.	
<u>Puccinia Dayi</u> Clint.	Saskatchewan 1928
<u>Solanum triflorum</u> Nutt.	
<u>Entyloma australe</u> Speg.	Saskatchewan 1927 1928
<u>Sphaeralcea coccinea</u> (Nutt.) Rydb.	
<u>Puccinia Sherardiana</u> Körn.	Saskatchewan 1927
<u>Solidago graminifolia</u>	
<u>Rhytisma</u> sp.	Quebec 1927
<u>Symphoricarpos</u> sp.	
<u>Microsphaera diffusa</u> Cke.&Pk.	Saskatchewan 1928
<u>Taraxicum officinale</u>	
<u>Puccinia Taraxici</u> (Weber) Flowr.	Nova Scotia 1927 Ontario 1928

I N D E X

ALFALFA	26
Chemical Injury	27
Peronospora Trifoliorum de Bary	27
Plenodomus Meliloti Dearn. & Sanford	27
Pseudopeziza Medicaginis (Lib.) Sacc.	26
Sclerotinia Sclerotiorum (Lib.) de Bary	27
Winter Injury	27
APPLE	34
Alternaria Mali J. W. Roberts	37
Bacillus amylovorus (Burr.) de Toni	39
Bitter Pit	38
Collar Rot	37
Crown Rot	39
Cytospora sp.	38
Drought Spot, Die Back, & Corky Core	37
Frost Injury	38
Gloeodes pomigena (Schw.) Colby	37
Gloeosporium perennans Zellar & Childs	35
Gymnosporangium Juniperi-virginianae Schw.	36
Leptothyrium Pomi (Mont. & Fr.) Sacc.	38
Nectria galligena Bers.	36
Neofabraea malicorticis (Cordley) Jackson	36
Penicillium expansum (Lk.) Thom.	38
Phoma pomi Pass.	38
Physalospora Malorum Shear	36
Podosphaera leucotricha (E. & E.) Salm.	37
Sclerotinia americana (Worm.) Nort. & Ezekiel	37
Stereum purpureum	36
Trichothecium roseum Link.	37
Venturia inaequalis (Cke.) Wint.	34
Winter Injury	39
APRICOT	40
Russetting	40
ARTICHOKE	54
Sclerotinia	54
ASPARAGUS	54
Puccinia Asparagi DC.	54
ASTER	93
Fusarium conglutinans Woll.	
var. Callestephi Beach	93
Yellows	93
AZALEA	93
Exobasidium Vaccini (Fekl.) Wor.	93
BALSAM FIR	88
Melampsorella elatina (Alb. & Schw.) Arth.	88

BARBERRY	93
<i>Puccinia graminis</i> Pers.	93
BARLEY	20
<i>Claviceps purpurea</i> (Fr.) Tul.	22
False Stripe	23
<i>Helminthosporium gramineum</i> Rabh.	22
<i>Helminthosporium sativum</i> P. K. & B.	23
<i>Ophiobolus graminis</i> Sacc.	24
<i>Pseudomonas translucens</i> J.J. & R.	24
<i>Puccinia anomala</i> Rostr.	20
<i>Puccinia glumarum</i> (Schm.) Erikss. & Henn.	21
<i>Puccinia graminis</i> Pers.	20
<i>Pyrenophora teres</i> (Died.) Dresch.	23
(<i>Helminthosporium teres</i> Sacc.)	
<i>Rhynchosporium secalis</i> (Heins.) Davis	24
<i>Septoria Passerinii</i> Sacc.	24
<i>Ustilago Hordei</i> (Pers.) K. & S.	21
<i>Ustilago nuda</i> (Jens.) Rostr.	21
BEAN	54
<i>Colletotrichum Lindemuthianum</i>	54
(Sacc. & Magn.) Bri. & Cav.	
Mosaic	55
<i>Pseudomonas Phaseoli</i> E.F.Sm.	55
<i>Sclerotinia Sclerotiorum</i> (Lib.) Mass.	55
<i>Uromyces appendiculatus</i> (Pers.) Lev.	55
BEECH	88
<i>Gnomonia</i> sp.	88
BEST	56
<i>Actinomyces scabies</i> (Thax.) Güssow	56
<i>Bacillus carotovorus</i> Jones	57
<i>Cercospora beticola</i> Sacc.	56
<i>Phoma</i> sp.	56
<i>Rhizoctonia</i> sp.	56
BLACKBERRY	40
<i>Gymnoconia Peckiana</i> (Howe) Trotter	40
<i>Plectodiscella veneta</i> (Speg.) Burk.	40
BLEEDING HEART	93
<i>Sclerotinia</i> sp.	93
BOX WOOD	88
<i>Blennoria Buxi</i> Fr.	89
<i>Gloeosporium Louisiae</i> Bäuml.	88
<i>Macrophoma Candellii</i> (B. & Fr.) Berl. & Vogl.	89
<i>Verticillium Buxi</i> (Link) Awd. & Fleisch.	89
<i>Volutella Buxi</i> (Cda.) Berk.	88

BUCKTHORN	93
Rust	93
BUTTERNUT	88
Marssonina juglandis (Lib.) P. Magnus	88
CABBAGE	57
Bacillus carotovorus	57
Corticium vagum B.&C.	58
Damping Off	58
Phoma lingam (Tode) Desmazieres	58
Plasmodiophora Brassicae Wor.	57
Pseudomonas campestris (Pamm.) E.F.Sm.	57
Sclerotinia Sclerotiorum (Lib.) Mass.	58
CARAGANA	94
Septoria Caraganae (Jacz.) P. Henn.	94
CARNATION	94
Alternaria Dianthi F. L. Stevens	94
Uromyces Dianthi (Pers.) Niessl	94
(=Uromyces caryophyllinus (Sch.) Wint.	
CARROT	58
Sclerotium Sclerotiorum (Lib.) Mass.	58
CAULIFLOWER	58
Bacillus carotovorus Jones	59
Plasmodiophora Brassicae Wor.	58
Pseudomonas campestris (Pamm.) E.F.Sm.	59
CELERY	59
Bacillus carotovorus Jones	60
Cercospora Apii Fr.	60
Physarum cinereum (Batsch.) F.	60
Septoria Apii Chester	59
Yellows	60
CENTAUREA	94
Puccinia Cyani Pass.	94
CHERRY	40
Botrytis cinerea Pers.	41
Coccomyces hiemalis Higgins	40
(Cylindrosporium hiemalis Higgins)	
Coryneum Beijerinckii Oud.	41
Dibotryon morbosum (Schw.) Theiss. & Syd.	41
Sclerotinia americana (Worm.) Nort. & Ezekiel	41
Taphrina minor Sadeb.	41
(=Exoascus minor Sadeb.)	

CHESTNUT	89
<i>Endothia parasitica</i> (Murr.) And.	89
CHINESE CABBAGE	59
<i>Plasmodiophora Brassicae</i> Wor.	59
CLARKIA	94
<i>Botrytis</i> sp.	94
CLOVER	28
<i>Uromyces Trifolii</i> (Hedw.f.) Lev. and	28
<i>U. Trifolii-repentis</i> (Cast.) Lirc.	
CLOVER, SWEET	29
<i>Ascochyta Meliloti</i> (Trel.) Davis	29
White Spot	29
COLUMBINE	94
<i>Alternaria</i> sp.	95
<i>Erysiphe Polygoni</i> DC.	94
CORN	29
<i>Ustilago Maydis</i> (DC.) Cda.	29
CRESS	61
<i>Peronospora parasitica</i> (Pers.) De Bary	61
CUCUMBER	61
<i>Cladosporium cucumerinum</i> Ell. & Arth.	61
CURRENT	42
<i>Cronartium ribicola</i> Fischer	42
DAHLIA	95
<i>Botrytis</i> sp. and <i>Pinotes</i> sp.	95
<i>Phoma Dahliae</i> Berk.	95
DELPHINIUM	95
<i>Erysiphe Cichoracearum</i> DC.	95
<i>Pseudomonas Delphinii</i> (E.F.Sm.) Stapp	95
ELM	89
<i>Fomes igniarius</i> Fr.	89
<i>Gnomonia ulmae</i> (Sacc.) Thüm.	89
FLAX	30
<i>Colletotrichum linicolum</i> Perth. & Laff.	31
<i>Fusarium Linii</i> Bolley	30
<i>Melampsora Linii</i> (Pers.) Desm.	30
FORAGE AND FIBRE CROPS	26

FOREST AND SHADE TREES	38
FRUIT CROPS	34
GERANIUM	95
<i>Bacterium Erodii</i> Lewis	95
GLADIOLUS	95
<i>Septoria Gladioli</i> Pass.	95
GOOSEBERRY	43
<i>Cronartium ribicola</i> Fischer	43
<i>Mycosphaerella Grossulariae</i> (Fr.) Lindau (<i>Septoria Ribis</i> Desm.)	44
<i>Pseudopeziza Ribis</i> Kleb. (<i>Gleosporium Ribis</i> (Lib.) Mont & Desm.)	44
<i>Puccinia Fringsheimiana</i> Kleb.	44
<i>Sphaerotheca Mors-Uvae</i> (Schw.) Berk.	43
GRAPE	44
<i>Guignardia Bidwellii</i> (Ell.) Viola & Ravaz.	45
<i>Plasmopara viticola</i> (Berk. & Curt.) Berl. & de Toni	45
<i>Uncinula necator</i> (Schw.) Burr.	44
GRASSES, CULTIVATED	32
AWNLESS BROME GRASS (<i>Bromus inermis</i> Leyss.)	32
<i>Claviceps purpurea</i> (Fr.) Tul.	32
<i>Pyrenophora Bromi</i> (Died.) Drechs.	32
CANADA BLUE GRASS (<i>Poa compressa</i> L.)	34
<i>Erysiphe graminis</i> DC.	34
KENTUCKY BLUE GRASS (<i>Poa pratensis</i> L.)	32
<i>Erysiphe graminis</i> DC.	32
MILLET (<i>Setaria italica</i> Beauv.)	33
<i>Pseudomonas</i> sp.	33
TIMOTHY (<i>Phleum pratense</i> L.)	33
<i>Claviceps purpurea</i> (Fr.) Tul.	33
<i>Heterosporium Phlei</i> Gregory	33
<i>Puccinia Phlei-pratensis</i> Erikss. & Henn.	33
<i>Scolicotrichum graminis</i> Fekl.	33
WESTERN RYE GRASS (<i>Agropyron tenerum</i> Vasey)	33
<i>Claviceps purpurea</i> (Fr.) Tul.	33
<i>Puccinia glumarum</i> (Schm.) Erikss.	33
<i>Ustilago Agropyri</i> Clinton	33

HAWTHORN	89
Phyllactinia corylea (Pers.) Karst.	89
HOLLYHOCK	96
Puccinia Malvacearum Bert.	96
Sclerotinia sp.	96
HORSE RADISH	62
Ramularia Armoraciae Fekl.	62
HYACINTH	96
Pseudomonas Hyacinthi (Wakk.) E.F.Sm.	96
LETTUCE	62
Bacillus carotovorus Jones	62
Botrytis cinerea Pers.	62
Sclerotium Sclerotiorum (Lib.) De Bary	62
LILAC	96
Microsphaera Alni (Wallr.) Salm.	97
Phyllosticta Halstedii E. & P.	96
LILY	97
Botrytis elliptica (Berk.) Cke.	97
LOGANBERRY	45
Bacillus desiccans Foster	45
MAPLE	89
Gloeosporium apocryptum Ell. & Ev.	90
Nectria cinnabarina (Tode) Fr.	90
Rhytisma acerinum (Pers.) Fr.	89
Uncinula circinata Cke. & Pk.	90
Verticillium sp.	89
MISCELLANEOUS PLANTS	101
NARCISSUS	97
Botrytis narcissicola Kleb.	97
OAK	90
Gloeosporium nervisequum (Fekl.) Sacc.	90
OATS	13
Blasting of heads	20
Claviceps purpurea (Fr.) Tul.	19
Fusarium sp.	19
Gibberella Saubinetii (Mont.) Sacc.	19
Helminthosporium Avenae Eidan.	19
Pseudomonas coronofaciens (Ch. Elliott) Stev.	19
Puccinia coronata Cda.	16

Puccinia graminis Pers.	13
Root Rots.	20
Ustilago Avenae (Pers.) Jens.	17
Ustilago levis (K. & S.) Magn.	18
ONION	62
Botrytis Allii Mann.	63
Fusarium sp.	64
Peronospora Schleideni Unger	62
Urocystis Cepulae Frost	64
ORNAMENTAL PLANTS	93
PANSY	97
Alternaria sp.	97
Colletotrichum tricoloris R.E.Sm.	97
PARSNIP	64
Ramularia pastinacea Bubak.	64
PEA	64
Ascochyte Pisi Lib.	65
Erysiphe Polygoni DC.	64
Mosaic	65
PEACH	45
Cladosporium carpophilum Thüm	45
Sclerotinia americana (Worm.) Mort. & Ezekiel	46
Taphrina deformans (Berk.) Tul.	45
Verticillium sp.	46
PEAR	46
Bacillus amylovorus (Burr.) de Toni	46
Drought Spot	47
Fabraea maculata Atk.	46
(Entomosporium maculatum Lev.)	46
Venturia pyrina Aderh.	46
PEONY	97
Botrytis Paeoniae Oud.	97
Winter Injury	97
PHLOX	98
Erysiphe Cichoracearum DC.	98
PINE	90
Cronartium ribicola Fisch.	90
PLUM	47
Coccomyces prunophore Higgins	48
(Cylindrosporium prunophore Higgins)	
Dibotryon morbosum (Schw.) Theiss. & Syd.	47
Sclerotinia americana (Worm.) Mort. & Ezekiel	48
Taphrina Pruni Tul.	47

POPLAR	90
Hypoxylon pruinaum (Klotzsch) Cke.	91
Septoria populicola Peck.	91
Uncinula Salicis (DC.) Wint.	90
POTATO	66
Actinomyces scabies (Thax.) Güssow	77
Alternaria Solani (Ell. & Mart.) Jones & Grout.	77
Bacillus phytophthorus (Frank) Appel.	77
Corticium Solani (Prill. & Del.) Bourd. & Galz.	76
Curly Dwarf	79
Fusarium spp.	78
Hollow Heart	80
Leaf Roll	79
Mosaic	79
Net Necrosis	80
Phoma sp.	79
Phytophthora infestans (Mont.) de Bary	75
Spindle Tuber	80
Spondylocadium atrovirens Harz.	78
Spongospora subterranea (Wallr.) Lagerh.	78
Streak	80
QUINCE	53
Gymnosporangium germinale (Schw.) Kern.	53
RASPBERRY	48
Didymella applanata (Niessl) Sacc.	49
Gymnoconia Peckiana (Howe) Trotter	50
Kuehneola albida (Kühn) Magn.	50
Leaf Curl	51
Leptosphaeria Coniothyrium (Fuck.) Sacc.	48
Mosaic	50
Mycosphaerella Rubi Roark	49
(Septoria Rubi Westend.)	
Plectodiscella veneta Burk.	46
Sphaerotheca Humuli (DC.) Burr.	49
RHUBARB	80
Ascochyta Rhei E. & E.	80
ROSE	98
Cercospora rosicola	98
Diplocarpon Rosae Wolf.	
(Actinonema Rosae (Lib.) Fr.)	98
Phragmidium speciosum (Fr.) Cke.	98
Pseudomonas tumefaciens (Sm. & Towns.) Dugg.	98
Sphaerotheca pannosa (Wall.) Lev.	98

RYE	24
<i>Claviceps purpurea</i> (Fr.) Tul.	25
<i>Erysiphe graminis</i> DC.	26
<i>Fusarium</i> sp.	26
<i>Helminthosporium sativum</i> P.K. & B.	25
Leaf and Stem Spot	26
<i>Puccinia dispersa</i> Erikss.	25
<i>Puccinia graminis</i> Pers.	24
<i>Pseudomonas translucens</i> J.J. & R.	25
var. <i>Secalis</i> (R.G. & J.) Stapp.	
SNAPDRAGON	99
<i>Colletotrichum Antirrhini</i> Stewart	99
<i>Puccinia Antirrhini</i> Diet. & Holw.	99
SPINACH	81
<i>Peronospora effusa</i> (Grev.) Rabh.	81
SPRUCE	91
<i>Chrysomyxa Weirii</i> Jackson	91
<i>Melampsoreopsis ledicola</i> (Pk.) Arth.	91
STOKESIA	99
<i>Botrytis</i> sp.	99
STRAWBERRY	51
<i>Botrytis</i> sp.	52
<i>Diplocarpon Earliana</i> (Schw.) Lindau	52
<i>Aycosphaerella Fragariae</i> (Schw.) Lindau	51
<i>Sphaerotheca Humuli</i> (DC.) Burr.	52
SUNFLOWER	31
<i>Puccinia Helianthi</i> Schw.	32
<i>Sclerotinia Sclerotiorum</i> (Lib.) Mass.	31
<i>Septoria Helianthi</i> Ell. & Kellerm.	32
SWEET CLOVER	29
<i>Ascochyta Meliloti</i> (Trel.) Davis	29
White Spot	29
SWEET PEA	99
Bud Drop	99
<i>Microsphaera diffusa</i> Cke. & Pk.	99
Mosaic	99
TOBACCO	81
<i>Cercospora Nicotianae</i> Ell. & Ev.	82
Curly Dwarf	83
Frenching	83
Hollow Stalk	83
Leaf Drop	83

Leaf Spot	83
Mosaic	82
<i>Pseudomonas angulata</i> (Froome & Murray) Stev.	82
<i>Pseudomonas tabacum</i> (W. & F.) Stev.	81
<i>Pythium de Baryanum</i> Hesse	82
Sore-Skin	83
Sunburn	83
<i>Thielavia basicola</i> Zopf.	81
 TOMATO	 83
<i>Alternaria Solani</i> (Ell. & Martin) Jones & Grout.	84
<i>Bacterium michiganense</i> (E.F.Sm.) Stev.	85
Blossom End Rot	84
Breakdown	85
<i>Phytophthora infestans</i> (Mont.) de Bary	84
<i>Septonia Lycopersici</i> Speg.	83
Yellows	85
 TULIP	 99
<i>Botrytis Tulipae</i> (Lib.) Lind.	99
<i>Fusarium</i> sp.	100
<i>Rhizoctonia Tuliparum</i> (Kleb.) Whetz. & Arth.	100
 TURNIP	 86
<i>Actinomyces scabies</i> (Thax.) Güssow	87
<i>Cercospora albomaculans</i> (Ell. & Ev.) Sacc.	86
<i>Corticium Solani</i> (Prill. & Del.) Bourd. & Galz.	86
<i>Erysiphe Polygoni</i> DC.	87
<i>Peronospora parasitica</i> (Pers.) de Bary	87
<i>Plasmodiophora Brassicae</i> Wor.	86
<i>Phoma Lingam</i> (Tode) Desm.	86
 VACCINIUM	 100
<i>Exobasidium Vaccinii</i> (Fekl.) Wor.	100
 VEGETABLE AND FIELD CROPS	 54
 VINCA	 100
<i>Puccinia Vincae</i> (DC.) Berk.	100
 VIOLET	 100
<i>Alternaria Violae</i>	100
<i>Puccinia Violae</i> (Schum.) DC.	100
 WHEAT	 1
<i>Bacterium atrofaciens</i> McCulloch	12
Chemical Injury, etc.	13
<i>Claviceps purpurea</i> (Fr.) Tul.	7
<i>Erysiphe graminis</i> DC.	10
Foot and Root Rots	8

Frost Damage	13
Gibberella Saubinetii (Mont.) Sacc.	13
Hail Damage	13
Leaf Spot	12
Pseudomonas translucens J.J. & R.	11
var. undulosum J.J. & R.	11
Puccinia glumarum (Schm.) Erikss. & Henn.	4
Puccinia graminis Pers.	1
Puccinia triticina Erikss.	3
Septoria nodorum Berk.	9
Septoria spp.	11
Tilletia Caries (DC.) Tul.	5
and Tilletia foetens (Berk.) Trel.	5
Ustilago Tritici (Pers.) Jens.	6
WILLOW	91
Fomes ignarius Fr.	92
Fusicladium saliciperdu (All. & Tub.)	91
Lind. and Physalospora Miyabeana Fukushi	91
Melampsora Bigelowii Tuck.	91
Rhytisma salicinum Fr.	91
Uncinula Salicis (DC.) Wint.	92
Valsa sp.	92

DOMINION OF CANADA
DEPARTMENT OF AGRICULTURE
EXPERIMENTAL FARMS BRANCH.

H. T. GUSSOW,
Dominion Botanist.

E. S. ARCHIBALD,
Director.

N I N T H A N N U A L
R E P O R T
O N T H E
P R E V A L E N C E O F P L A N T D I S E A S E S
I N T H E
D O M I N I O N O F C A N A D A
1 9 2 9.

. o O o

COMPILED BY:

I. L. CONNERS,
PLANT PATHOLOGIST.

FOREWORD

The present report deals with the prevalence of plant diseases in the Dominion of Canada for the year 1929. As in former years the information was compiled from the records submitted by our collaborators, to whom I wish to express my thanks. I am especially indebted to Drs. Henry and Sanford for their summaries of plant diseases in Alberta and to Dr. Simmonds and Mr. Gordon for summaries on root rot diseases in Saskatchewan and Manitoba. I am also greatly indebted to Mr. R. C. Russell and other members of the Dominion Laboratory of Plant Pathology at Saskatoon for the excellent notes accompanying their records of occurrence of many diseases.

I. L. Connors,
Plant Pathologist.

Division of Botany,
Ottawa, Canada.
January, 1931.

COLLABORATORS

BRITISH COLUMBIA

H. R. McLarty,)	
R. C. Roger,)	Dominion Laboratory of Plant Pathology,
G. E. Woolliams,)	Summerland, B. C.
W. Newton,)	
M. Jones,)	Dominion Laboratory of Plant Pathology,
C. Yarwood,)	Saanichton, B. C.
J. W. Eastham,	B. C. Dept of Agriculture, Victoria, B. C.
H. S. MacLeod,	" " " " " "

ALBERTA

G. B. Sanford,)	
W. C. Broadfoot,)	Dominion Laboratory of Plant Pathology,
J. W. Marritt,)	Edmonton, Alta.
H. T. Robertson,)	
A. W. Henry,)	
D. S. Aamodt,)	University of Alberta, Edmonton, Alta.
R. Newton,)	

SASKATCHEWAN

P. M. Simmonds,)	
R. C. Russell,)	
G. A. Scott,)	
B. J. Sallans,)	Dominion Laboratory of Plant Pathology,
H. W. Mead,)	Saskatoon, Sask.
C. H. Bryce,)	
W. P. Fraser,)	University of Saskatchewan,
T. C. Vancerpoo,)	Saskatoon, Sask.
J. H. Ledingham,)	
J. W. Cannell,	Dominion Experimental Farm, Indian Head, Sask.
J. L. Van Camp,	Dominion Forest Nursery Station, Indian Head, Sask.

MANITOBA

J. H. Craigie,)	
W. L. Gordon,)	
W.A.F. Hagborg,)	
B. Peturson,)	
T. Johnson,)	Dominion Laboratory of Plant Pathology,
W. F. Hanna,)	Winnipeg, Man.
Margaret Newton,)	
A. M. Brown,)	
W. Popp,)	
F. J. Greaney,)	
G. R. Bisby,	Manitoba Agricultural College, Winnipeg, Man.

G. H. Berkeley,)
 J. C. Chamberlain,)
 L. W. Koch,)
 J. C. Perrault,)
 R. S. Willison,)
 G. O. Madden,)
 D. L. Bailey,)
 G. B. Montserin,)
 John Dearness,)
 J. E. Howitt,)
 R. E. Stone,)
 D. R. Sands,)
 W. G. Evans,)
 L. A. Major,)
 F. L. Drayton,)
 Irene Mounce,)
 J. Tucker,)
 A. W. McCallum,)
 J. B. McCurry,)
 H. Groh,)

Dominion Laboratory of Plant Pathology,
 St. Catharines, Ont.

University of Toronto, Ont.

London, Ont.

Ontario Agricultural College, Guelph, Ont.

Tobacco Division, Central Experimental Farm,
 Ottawa, Ont.

Division of Botany, Central Experimental Farm,
 Ottawa, Ont.

QUEBEC

H. N. Rustess,)
 B. Baribeau,)
 G. Ethier,)
 J. Coulson,)
 J. H. Machacek,)
 F. L. Godbout,)

Dominion Laboratory of Plant Pathology,
 Ste. Anne de la Pocatiere, Que.

Macdonald College, Que.

NEW BRUNSWICK

D. J. MacLeod,)
 R. E. Richardson,)
 R. B. MacCormack,)
 C. H. Godwin,)
 R. Harrison,)
 R. J. Macleod,)

Dominion Laboratory of Plant Pathology,
 Fredericton, N. B.

NOVA SCOTIA

J. F. Hockey,)
 K. A. Harrison,)
 W. E. McCulloch,)
 D. F. Putnam,)
 P. E. Donat,)

Dominion Laboratory of Plant Pathology,
 Kentville, N. S.

PRINCE EDWARD ISLAND

R. R. Hurst,)
 L. J. Howatt,)
 S. G. Peppin,)

Dominion Laboratory of Plant Pathology,
 Charlottetown, P. E. I.

DISEASES OF CEREAL CROPS.

WHEAT

STEM RUST - Puccinia graminis Pers.

B. C. -

No rust was observed in 1929. On the experimental plots at Salmon Arm in 1928, several varieties were found infected with stem rust. As far as we are aware this is the first reported collection of stem rust on wheat in

B. C.

Alta.

About 40 barberry seedlings, which had apparently escaped, were found rusted June 24 at Claresholm. Stem rust was first collected on wheat at Vermilion on Aug. 16. Very light infections were found scattered over the province as far north as Legal and St. Paul. It was not abundant in any field nor caused any appreciable damage.

In the uniform rust nurseries, rust was not observed at Lethbridge or Beaverlodge, while traces of rust were recorded on only a few susceptible varieties at Lacombe and Edmonton.

Sask.

Only traces of rust were collected with difficulty in the district north of Regina on July 5. In the previous ten days, no rust was found from Moose Jaw and Assiniboia, through Weyburn and Indian Head, to Yorkton and Moosomin. Rust was first collected at Saskatoon on July 22, at Borden on July 23, and at Biggar on July 26. On July 29 and 30 traces could be found at most places in the Qu'Appelle Valley and northward through Yorkton, and Wroxton. Although absent on July 27, stem rust was collected July 31, at Indian Head. Traces of rust were reported from numerous places in the province but nowhere did stem rust cause appreciable damage.

Infections of a trace to 10 per cent were observed on the uniform rust nurseries at Indian Head, while the infections were progressively lighter at Saskatoon, Rosthern, Scott and Swift Current, where a trace only was recorded in a few varieties.

Man.

Traces of stem rust were first found on July 3 at Brandon and Portage la Prairie. None was found the previous week from Winnipeg to Morden, Gretna and Emerson back to

Wheat.

Winnipeg. On July 5 and 6 scattered pustules could be found on wheat throughout this area. Although the stationary spore traps for June 17 showed a heavy shower of urediniospores on that day, infection was not noticeable until the date indicated.

The weather conditions throughout Western Canada as a whole were highly unfavourable for rust development. Only in Manitoba did rust show signs of becoming serious. It was exceptionally dry throughout the growing period. During May and June it was very cold and during July and August unusually hot. In most places drought was a more important factor than rust. In a few fields in the Red River Valley and on the Fertige Plains rust may have caused some damage. Infections of 20 to 30 per cent were observed in scattered fields, where the crop was late or heavy. Farther west and northward through Regina, Saskatoon, Swift and Dauphin, the amount of rust was generally lighter. Durum wheat, except in the rust nurseries, had never more than a trace of rust.

At Winnipeg, in the uniform rust nurseries, 10 to 50 per cent of stem rust developed on the more susceptible varieties of common wheat, while 15 per cent was reported on susceptible durum varieties. At Brandon and Morden rust infection was considerably less.

Ont. -

Stem rust was fairly severe in the rust nurseries at Ottawa and Guelph, 20 to 65 being reported on some varieties.

Que. -

Pyrenia, but not poeia, were found on the barberry at Macdonald College on May 26. In the rust nursery at Ste. Anne de la Pocatiere, infection was generally lighter than in Ontario.

N. B. -

Stem rust was heavy at Fredericton in the rust nursery there. Slight to moderate infection was observed in York county.

N. S. -

Two rust nurseries were sown in Nova Scotia, one at Kentville and the other at Yarmouth. Rust infection was decidedly less at the latter place while at Kentville the infection was typical of other places in eastern Canada.

Wheat.

P. E. I. -

General and moderate infection throughout the province. The rust percentages recorded in the rust nursery at Charlottetown were similar to other places in eastern Canada.

LEAF RUST - Puccinia triticina Erikss.

B. C. -

Considerable leaf rust developed on some varieties in the experimental plots at Salmon Arm.

Alta. -

The first collection of leaf rust was made on July 19 at Claresholm on winter wheat. The infections were very light and not general in the fields. There was much less leaf rust in Alberta in 1929 than in 1928.

Sask. -

Leaf rust was general, but not severe except where the grain was late.

Man. -

Leaf rust was first collected at Horden on June 7. During the first week of July this rust could be found in most fields of common wheat. Generally about 50 per cent of the plants were affected, with the degree of infection varying from a trace to 5 per cent. The infection appeared to be patchy. At St. Adolphe and Riverville, two places south of Winnipeg, in certain spots 50 to 100 per cent of the plants were affected. Later the infection became more general, 50 per cent of the leaf surface being covered with rust.

P. E. I. -

Moderate infection was present on all varieties grown.

STRIPE RUST - Puccinia glumarum (Salm.) Erikss. & Henn.

Alta. -

Stripe rust was prevalent from south of Calgary to the Montana boundary, especially so in the Claresholm district. Only traces occurred north and north-east of Calgary.

BUNT - Tilletia caries (DC.) Tul. and Tilletia foetens (Berk.) Berl.

Alta. -

Bunt was unusually abundant this year throughout the grain growing area and caused an appreciable loss. In one

- 4 -

Wheat.

field as high as 20 per cent of the heads were infected. Tilletia Caries was far more common than T. foetens, which was found in the southern part of the province only, near Cardston.

Sask. -

Wheat bunt was only reported from the southern and eastern parts of the province. In general a trace to 2 per cent was observed. The samples from the southern area on common wheat were infected with Tilletia foetens, samples with the two species mixed were found about Killebuck and west, while a collection made at Wroxton was pure T. Caries. Durum wheat was affected only with T. Caries. In one field of durum wheat near Summerberry, 40 per cent of the heads were found infected.

Man. -

Approximately 15 per cent of the ears of durum wheat were infected with bunt, while 1 per cent of common wheat was infected. In one field over 50 per cent of the heads of durum wheat were infected with Tilletia Caries.

N. B. -

Slight infection of wheat by Tilletia foetens recorded for York county.

P. E. I. -

Only traces of bunt caused by Tilletia foetens observed.

LOOSE SMUT - Ustilago Tritici (Pers.) Jans.

Alta. -

Loose smut was more common than bunt. The infections, however, were much lighter and caused less damage. Appreciable loss sustained in a number of fields. Infections were not as general in their distribution as in 1928.

Sask. -

Loose smut was common and widely distributed. Usually only a trace was present, but fields showing increasing amounts of infection up to 7 per cent were observed.

Man. -

Infection with loose smut was general and usually light, being not more than 1 per cent. In several fields of Reward, however, one to 2 per cent was observed. The two highest infections recorded on this variety were 4.5 per cent at

Wheat.

Two Mountains and 7 per cent in the rotation plots at the Experimental Station at Morden. Kota wheat at Gladstone showed 10 per cent of the heads smutted and Marquis at Minto 4.7 per cent.

N. B. - Slight infection observed in York county.

P. E. I. - Loose smut was general over the province. Average infection was estimated to be 1.5 per cent.

GLUME BLOTCH - Scotioria nodorum Berk.

Alta. - First collection made at Edmonton on August 15. It was not as prevalent as in 1928 and was confined mostly to the central portion of the province. Damage trace.

Sask. - Glume blotch was not prevalent in 1929. However, infections observed on heads, stems and leaves, especially on lodged plants.

N. B. - Slight infection reported for York county.

P. E. I. - Traces only of glume blotch were found this year. The disease was observed on Huron, the Fife and Marquis.

HEAD BLIGHT - Fusarium spp. and Gibberella Saubinetii (Mont.) Sacc.

Alta. - Observed several times.

N. B. - Slight infection recorded for York county.

P. E. I. - This disease caused considerable loss in Red Fife, White Fife and Huron.

HEAD BLIGHT - Helminthosporium sativum P. K. & B.

P. E. I. - Not common. It was observed on Kubanka at the Dominion Experimental Farm, Charlottetown.

Wheat.

POWDERY MILDEW - Erysiphe graminis DC.

Alta. - Not common. First collection was made on June 18 on winter wheat at Edmonton. It was later collected on spring wheat at several places. Mildew caused a slight amount of damage on the experimental plots at Edmonton.

P. E. I. -

Powdery mildew was moderately abundant on Little Club at Charlottetown in September.

ERGOT - Claviceps purpurea (Fr.) Tul.

Alta. -

Ergot was observed on wheat. The disease was comparatively rare in 1929.

P. E. I. -

Ergot on wheat was found once when it was observed on The Experimental Farm, Charlottetown.

BASAL GLUME ROT - Pseudomonas atrofaciens (McFall.) Stey.

Alta. -

Basal glume rot was common on wheat being found in widely scattered areas of central Alberta. It was less prevalent than the previous year. It caused a trace to slight damage.

BLACK CHAFF - Pseudomonas translucens J.J. & R.
var. undulosa J.J. & R.

Alta. -

There was very little black chaff in 1929. Infections, however, were found in the north central section of the province. At Dapp a field of registered Marquis wheat was 100 per cent infected. Garnet in the same field was clean. Damage trace to slight.

Sask. -

A sample of Reward wheat from Huronville appeared to be affected with black chaff.

N. B. -

Slight infection of black chaff reported from York county.

NEMATODE DISEASE - Heterodera punctata Thorne.

Alta. -

Specimens of this nematode were collected at Cowley and

Stoney Plain on winter and spring wheat respectively.

Sask. -

This disease was observed at two places in east central Saskatchewan. At Muenster the field had been sown to wheat for at least three years in succession. Nematodes were plentiful in certain patches. Affected plants were stunted. At Amn-
nheim wheat plants in a small patch were found to bear many gravid females on their roots. These plants appeared stunted and unthrifty.

BLACK GLUMES - Non-parasitic.

Alta. -

Several specimens of wheat heads showing blackened glumes were received from different parts of the province. This is distinct from black chaff. It apparently does not spread from affected plants to normal ones in the field. Seeds from affected heads when sown, however, give plants which reproduce the abnormality. Several varieties including Reward, Marquis and Red Bobs were affected (A.W. Henry).

CRINKLE JOINT - Non-parasitic.

Sask. -

This disease was observed late in the season at Indian Head on Marquis to a slight extent.

FOOT AND ROOT - ROT DISEASES
OF CEREALS.

As the root-rots caused by different root-rotting organisms are similar in appearance and are not infrequently difficult to separate from each other, they are here treated together for each province.

Alta. -

The observations reported for Alberta refer only to these diseases as they appear on wheat.

Take-all (Ophiobolus graminis Sacc.). It was very difficult to find typical symptoms of take-all. Light infections were found north and west of Edmonton, where moisture was sufficient to produce fairly good crops. Perithecia were found only near Spruce Grove. Damage was slight.

Most of the root-rot damage appeared to be caused by Helminthosporium sativum Pamm. King and Bakke, Fusarium spp. Wojnowicia graminis (McAlp.) Sacc. & D. Sacc. and Leptosphaeria

Cereal Root-rots

herpotrichoides de Not., although it was difficult to evaluate the damage on account of drought injury. Garnet wheat appeared to be less heavily attacked than other common varieties. Leptosphaeria herpotrichoides was found to be widely distributed in central Alberta, while Wojnowicia graminis, Helminthosporium sativum and Fusarium spp. were general in all parts of the province.

Heavy infection of foot-rot causing severe damage was observed on the continuous wheat plots at the School of Agriculture at Claresholm, while the damage was only a trace on the rotation plots.

The following fungi were also collected on wheat: Mycosphaerella Fulasnei (Jancz.) Lindau, Ascochyta graminicola Sacc. Macronema Hennebergii, (Kuhn) Berl. & Vogl.

Seedling root-rot causing significant damage was not observed this year.

Browning caused by Pythium spp. was not observed in Alberta.

Sask. -

In recording observations on root-rots of cereals in Saskatchewan four types of root-rot are recognized: take-all (Ophiobolus graminis), prematurity blight, browning, and Helminthosporium-Fusarium rot (Helminthosporium sativum and Fusarium Spp.)

In prematurity blight individual plants are affected here and there throughout the field. The plant appears normal in every way except that it takes on a distinct bleached appearance while healthy plants are still green. The heads are also invariably empty. The cause of the disease is unknown.

Browning appears on seedlings when they are about four to six weeks old, the lower leaves suddenly turning brown and dying. The disease occurs in large patches. The growth of the plant is retarded and late in the season the diseased areas are noticeable by the thin stand of single tiller plants and abundant weed growth.-(1)

(1) These four types of root rot are more fully outlined in: Root-rots of Cereals. Dom. Can. Exp. Farm Circ. 72. 1929.

Cereal Root-rots.

The root-rot survey in Saskatchewan embraced the important crop districts. The extremely dry weather interfered greatly with the diagnosis of these diseases. In all 566 fields were examined and reported; 481 were in wheat, 96 in oats, 70 in barley, 16 in rye and 3 in flax.

The distribution of root-rot types and severity of disease on different cereals is shown in the table 1.

This season differed from previous years by the predominance of the Helminthosporium-Fusarium type. Prematurity blight was difficult to recognize as in general the dry weather shortened the ripening period.

There were not as many cases of take-all reported as usual; but in all probability the symptoms were masked by the lack of rain.

More than one type of root-rot was frequently observed in the same field. In 481 fields of wheat, 297 or 61.7 per cent showed one type of root rot; 122 or 25.3 per cent 2 types, 7 or 1.4 per cent 3 types and 58 or 11.6 per cent were free from disease.

The amount of injury caused by root-rots in 807 cases reported for all crops was as follows:-

No injury occurred in	16.5	per cent of the cases.
Injury trace	" "	30.9 " " " " "
Injury slight	" "	33.4 " " " " "
Injury moderate	" "	15.9 " " " " "
Injury severe	" "	3.3 " " " " "

From his studies of take-all Russell (2) believes that the casual organism, Ophiobolus graminis Sacc. is indigenous to Western Canada. The disease is confined mainly to the semi-wooded areas. Where take-all is prevalent the disease causes noticeable damage in the second and succeeding crops after new breaking. If the field is summer-fallowed, or a crop of oats is grown, very little take-all may appear for several years. After land has been raising western rye grass or brome grass for a number of years and is then broken and sown to wheat, take-all causes severe injury. The actual loss from Take-all is difficult to estimate accurately, but the collective damage throughout Saskatchewan in wet years is at present very great.

(2) Russell, R. C. Field studies of take-all in Saskatchewan. Sci. Agr. 10: 654-668. 1930.

While studying the browning root-rot of cereals Vanterpool and Ledingham (3) found a fungus belonging to the lower Phycomycetes, hitherto undescribed, associated with rootlet injury of wheat. The organism was named Lagena radiculicola. They are of the opinion however, that the fungi really responsible for the trouble in most instances are species of Pythium or of closely related genera.

Vanterpool (4) has also reported, as the results of his experiments, that Asterocystis radialis de Willd. is a normal inhabitant of Saskatchewan soils. Although the fungus has been found in finer rootlets of oats, wheat, barley, rye, maize, western rye grass and field mustard (Seneciois arvensis L.) in potted soil and barley in the field, he doubts whether it could cause any significant damage except under the most favourable conditions and then only on oats.

Man. -

During 1929, two hundred and thirty collections of plants, all apparently infected with root and foot-rotting organisms, were made in 108 localities within the province. The majority of the collections were obtained from wheat and barley, but a few from oats and rye.

Root-rots and foot-rots were not confined to any definite localities, but were widely distributed throughout the grain-growing area of the province. Infected plants could be found, to a greater or less extent, in almost every field of wheat and barley examined. Very few of the fields of oats and rye showed infection by root-rotting organisms.

The amount of infection in different fields varied from a mere trace to almost one hundred per cent of the plants. Approximately twenty-five per cent of the fields of wheat and barley showed infection of fifty per cent of the plants, or more. Infected plants generally appeared to be more prevalent in the lighter soils, although they were by no means confined to them.

Foot-rot symptoms were more evident than definite injury to the root. The basal part of infected plants, between the crown and first node, showed distinct browning. These plants were not always limited to definite patches in the fields, but

(3) Vanterpool, T.C. and Ledingham, G.A. Studies on "browning" root-rot of cereals. I. The association of Lagena radiculicola n.gen; n.sp., with root injury of wheat. Can. Jour. Research 2: 171-194. 1930.

(4) Vanterpool, T.C. Asterocystis radialis in the roots of cereals in Saskatchewan. Phytopath. 20:677-680. 1930.

Cereal Root-rots

Isolated plants also showed this discoloration. In a few fields, however, the roots of the plants were poorly developed and discolored, but the basal part of the stems was normal. Occasionally, both the roots and the basal part of the stem were discolored.

Isolations made on potato dextrose plates from the discolored basal part of the stem and from the roots of apparently diseased plants yielded Helminthosporium sativum P.K. & B., and Fusarium spp. Helminthosporium was more frequently isolated this year, from individual collections, than Fusarium, although the latter was also commonly present.

Take-all (Ophiobolus graminis) was not detected this year by a macroscopic examination of the plants in the field, although it was frequently found in 1928. The severe drought during the summer may have seriously retarded its development. It does not seem possible that it could be entirely absent.

There is no doubt, that where there is a heavy infection, root-rotting organisms are causing a decided reduction in the yield, particularly of wheat and barley. However, if the infection is only slight, the plants appear to be capable of maturing seed, with little, if any reduction in the yield, especially if growth conditions are favourable (W.L.Gordon).

OATS

STEM RUST - Puccinia graminis Pers.

Alta. -

Stem rust on oats was first collected at Wainwright on Aug. 17. Later a few infections were found north and east of Edmonton. No damage.

Sask. -

Traces of stem rust were found fairly generally in the south-eastern part of the province, but no damage was done.

Man. -

Stem rust was general over the province. Oats, which were sown fairly early, were only lightly affected. However, the degrees of infection was heavier as the oats were later. Very late oats were rather heavily rusted and the yield in some cases was lowered, but as the later sown oats constituted only a small portion of the crop the loss due to rust was small or negligible.

N. B. -

This disease was prevalent in York county.

P. E. I. -

Stem rust became prevalent late in the season. It was common on all the varieties grown in the province.

LEAF RUST - Puccinia coronata Corda.

Man. -

Traces of leaf rust were found at several places, but nowhere was the rust severe enough to do damage. A buckthorn hedge on a farm south of Boissevain was found heavily infected with the aecial stage. The nearest oats were some distance, however, from the hedge and no rust was observed on the plants. Several species of buckthorn were found rusted at the Experimental Station, Morden.

Ont. -

Rust on the buckthorn was collected on May 29 at Ottawa. The rust was heavy on oats in the smut experiment plot, C.E.F., Ottawa, Ont.

N. B. -

Leaf rust was prevalent in York county.

N. S. -

A moderate infection of leaf rust was found to be quite general in fields examined in four counties of central Nova Scotia.

P. E. I. -

Heavy infection was observed on all varieties. The rust was also collected on the buckthorn July 15.

SMUTS.

Covered Smut, Ustilago horis (Kellerm. & Swingle) Magn. and Loose Smut, Ustilago Avenae (Pers.) Jens.

B. C. -

A small amount of loose smut occurs each year resulting in very slight losses.

Alta. -

Both smuts are relatively common. Damage was usually only a trace, but losses of 20 per cent occurred in individual fields. The total would be considerable.

Sask. -

Covered smut is far more prevalent and destructive than loose. The following tabulation shows the relative prevalence:-

Oats.

Percentage Infection	Number of fields	
	<u>Covered smut</u>	<u>Loose smut</u>
trace	3	2
1 - 4	8	3
5 - 9	3	0
10 - 14	4	0
15 - 19	6	1
20	3	0
25	1	0

Man. -

Covered smut only was reported, infection varying from a trace to 5 per cent.

Que. -

In a field, where the seed was untreated, 30 per cent infection was observed. In a neighbouring field, where treated seed was sown, only 2 per cent of smut was found.

N. B. -

Covered smut was reported as prevalent where the seed had not been treated. Loose smut was also fairly abundant.

N. S. -

Both loose and covered smut were observed, the two species being frequently mixed together in the same field. Infection varied from 1 to 40 per cent.

P. E. I. -

Loose smut was reported as general over the province. In a field at Charlottetown infection of 10 per cent was recorded.

HALO BLIGHT - Pseudomonas coronofaciens (Ch.Elliott) Stev.

Alta. -

Halo blight was not common; less present than last year. Damage trace.

Sask. -

This disease was reported to be causing considerable leaf spotting at Cudworth.

Man. -

A variety (Minota x Wh. Russian) x Black Mesdag, No. 378, was badly spotted with halo blight especially on the older leaves in a variety plot at the Experimental Station, Morden.

This was the only variety in the midst of numerous other varieties to be affected. The disease was also present in the same variety at Winnipeg.

N. B. -

A slight amount of halo blight was present in York county.

HEAD BLIGHT - Fusarium spp. and Gibberella Saubinetii (Mont.) Sacc.

This disease was recorded once on Banner at Charlottetown, P. E. I.; and it was found causing slight infection in York county, N. B.

ANTHRACNOSE - Colletotrichum graminicolum (Ces.) Wilson.

Anthracnose was reported from Falher in the Peace River district, Alberta. A moderate infection of Banner was recorded at the Experimental Farm, Charlottetown, P. E. I.

ERGOT - Claviceps purpurea (Fr.) Tul.

Ergot was observed on oats in Alberta although the disease is rare this year.

BLAST - Non-parasitic.

Alta. -

This disease caused much damage throughout the province.

Sask. -

Blast was observed in many places, but generally it was causing only slight damage, except at Saskatoon where it was reported as common and severe.

P. E. I. -

Trace of blast occurred on Banner.

B A R L E Y

STEM RUST - Puccinia graminis Pers.

Alta. -

Stem rust was extremely rare.

Sask. -

Traces of rust were collected in the Qu'Appelle Valley and northward through Yorkton and Wroxton.

P. E. I. -

A trace of stem rust was found on Charlottetown No. 80.

Barley.

LOOSE SMUT - Ustilago nuda (Jens.) Rostr.

Alta. -

Loose smut was widely distributed, but was much less abundant and destructive than covered.

Sask. -

Although loose smut was widely distributed the infections were usually not more than 1 per cent. In only one field was the infection estimated to be from 5 to 10 per cent.

Man. -

Loose smut was collected a few times; usually small percentages.

N. B. -

This smut was reported to occur in York county.

N. S. -

Out of three fields examined in Pictou county one showed 3 per cent infection; the other two were free from smut.

P. E. I. -

A trace of infection was reported on Charlottetown No. 80 in the counties of Queens and Kings.

COVERED SMUT - Ustilago Hordei (Pers.) Kellerm. & Swingle.

Alta. -

Covered smut was common, causing important losses. The damage ranged from a trace to 30 per cent.

Sask. -

Covered smut was widely distributed, infection varying as follows:- 4 fields showing a trace; 8 with 1 to 4 per cent; 5 with 5 to 9 per cent and 1 field with 17 per cent.

N. B. -

Only slight infection with covered smut was observed in York county.

P. E. I. -

Two reports of covered smut on Charlottetown No. 80 on the Experimental Farm, Charlottetown.

STRIFE - Helminthosporium gramineum Rabh.

Stripe was found on widely scattered fields throughout Alberta. Damage was slight. This disease was more serious

Barley.

in the experimental plots at Edmonton than in 1928. This was believed to be due to the temperature being more favorable for the development of the disease. Some heavily infected plants were found at Beaverlodge, Peace River district.

The disease was reported to be quite prevalent on all varieties in New Brunswick and Prince Edward Island. It was also observed once in Quebec.

NET BLOTCH - Pyrenophora teres (Died.) Drechs1.
(Helminthosporium teres Sacc.)

Alta. -

Net blotch was widely distributed, but much less abundant than in 1928. Damage was trace to slight.

Sask. -

Although net blotch was widely distributed usually, infection was slight and the damage nil. In occasional fields infections were moderate to heavy, resulting in the premature death of the lower leaves. Hooded barley seemed to be more resistant than the common bearded varieties.

Man. -

In one field near Portage la Prairie a moderate infection of net blotch was observed.

P. E. I. -

Slight infection on Charlottetown No. 80 in Queens and Prince counties, and also on other varieties at the Experimental Farm, Charlottetown.

SPOT BLOTCH - Helminthosporium sativum Pann. King & Bakke.

This disease was more common in Alberta than last year. The experimental plots at Edmonton were badly infected. Damage was trace to slight. The disease also caused a foot rot in seedlings in a greenhouse at Macdonald College, Que.

M I S C E L L A N E O U S D I S E A S E S .

SCALD - Rhynchosporium Secalis (Oud.) Davis.

Scald was fairly common, but less in evidence than last year in Alberta. Damage trace. A light infection was also reported from Saskatoon, Sask.

Barley.

ERGOT - Claviceps purpurea (Fr.) Tul.

Ergot was reported on barley for Alberta and N. B., but in both provinces it was rare.

POWDERY MILDEW - Erysiphe graminis DC.

Slight infection reported throughout P. E. I.

BACTERIAL BLIGHT - Pseudomonas translucens Jones, Johns. & Reddy.

Light infections of this disease were observed several times on barley.

FALSE STRIPE - Cause unknown.

Slight infections were reported twice from Saskatchewan. The Heterosporium associated with this disease has been reported by Bisby et al, (Fungi Manitoba 1929) as being close to H. Avenae Oud.

Hormodendron Hordei Bruhne was collected on variety Regal at Beaverlodge, Alta. (W. C. Broadfoot).

R Y E .

LEAF RUST - Puccinia dispersa Erkss.

Leaf rust was fairly common but the infections were light in Alberta.

ERGOT - Claviceps purpurea (Fr.) Tul.

Alta. -

Ergot was observed on rye. It was however, comparatively rare this year.

Sask. -

Ergot was rare and only traces were found except on volunteer rye in a field of wheat on sandy soil. In the southern part of the province only one collection on rye was made. Up to this year, ergot had been getting more and more serious every year.

DISEASES OF FORAGE AND FIBRE CROPS.

ALFALFA

LEAF SPECK - Pseudopeziza Medicaginis (Lib.) Sacc.

Alta. - This disease is frequently observed, but it causes slight if any damage. Specimens were collected at Beaverlodge, Peace River district.

Sask. - Moderate to heavy infections were observed in two locations. Usually the infection is light.

Ont. - A very heavy infection developed in a 3 year old cover crop in a cherry orchard. This fact suggests that this disease may prove a real factor in the use of alfalfa for such a purpose.

This disease caused only slight infections in Quebec, N. B. and P. E. I.

OTHER DISEASES

ROOT ROT - Sclerotinia Sclerotiorum (Lib.) de Bary.

This disease is reported on alfalfa from Alberta. Not usually serious on this host.

ROOT ROT - Plenodomus Meliloti Dearn. & Sanford.

Common on alfalfa in Alberta. May cause serious damage.

DOWNY MILDEW - Peronospora Trifoliorum de Bary.

Infection was noted only in low lying areas in York county, N. B.

WINTER INJURY - Non-pathogenic.

Injury occurred in some localities in the winter 1928-29, in B. C.

COMMON CLOVER.

RUST - Uromyces Trifolii (Hedwf.) Lev. and
U. Trifolii-repentis Liro.

Alta. - The aecial stage of U. Trifolii-repentis was collected at Wabumun, Alta. Infection light and patchy.

N. B. - A slight general infection of U. Trifolii was observed in York county.

Common Clover.

N. S. -

A moderate infection of U. Trifolii was reported on second growth of red clover in a field at Annapolis causing slight leaf wilting.

P. E. I. -

As rust is said to be common on all clovers in P. E. I., it is probable that both species have been seen there.

LEAF SPOT - Pseudopeziza Trifolii (Biv.-Bern.) Fuck.

P. E. I. -

Common about Charlottetown, but not important.

N. B. -

Slight infection was reported in York county.

SOOTY SPOT - Dothidella Trifolii (Pers.) Bayl.-Elliott & Stansf
(Polytruncium Trifolii Kunze).

Que. -

General south of Montreal on white clover. A collection of sooty spot was made at Murray Bay on alsike clover. Infection light.

N. B. -

Slight infection of sooty spot in York county.

P. E. I. -

Common on clovers at the Experimental Farm, Charlottetown.

POWDERY MILDEW - Erysiphe Polygoni DC.

B. C. -

Mildew was general on red clover.

Que. -

Reported on white clover from Rougement.

N. B. -

Slight general infection in York county.

N. S. -

Most of the second growth in hayfields showed scattered to general infection of mildew.

P. E. I. -

Mildew reported as general throughout the province on red clover.

DOWNY MILDEW - Peronospora Trifoliorum de Bary.

This disease occurred generally over Prince Edward Island, but it caused very little damage.

MOSAIC - Virus disease.

B. C. -

This trouble occurred to a slight extent throughout the Okanagan Valley on white clover.

N. B. -

Only isolated specimens were observed to be diseased in York county.

P. E. I. -

Plants affected with mosaic were recorded at several places near or on the Experimental Farm, Charlottetown.

SWEET CLOVER.STEM CANCER - Ascochyta Meliloti (Trel.) Davis.

Alta. -

Light infection of stem canker was present. Specimens were collected at Edmonton.

Sask. -

Stems of the first crop stubble were found rather heavily diseased at Clavet.

Man. -

Collected at Dauphin on yellow sweet clover.

ROOT ROT - Sclerotinia Sclerotiorum (Lib.) de Bary.

This root rot caused some damage in Alberta, principally on sweet clover.

ROOT ROT - Plenodomus Meliloti Dearn. & Sanford.

This disease was common in Alberta especially on sweet clover, on which crop the damage was often severe. Certain of the experimental plots at Saskatoon were heavily diseased probably by the same fungus.

CORN.COMMON SMUT - Ustilago Zeae (Beck.) Unger.

Ont. -

Specimens sent for determination from Haitland and Vankleek Hill.

Corn.

Que. -

Up to 4 per cent of the plants were found infected in six home gardens at Ste. Anne de Pocatiere. It was reported as not very common in Iberville township, St. Johns county.

N. B. -

Infection was reported as slight in York county.

RUST - Puccinia Sorghi Schw.

Traces of rust were observed and collected at the Experimental Station, Charlottetown, P. E. I.

FLAX.

WILT - Fusarium Lini Bolley.

Alta. -

In a varietal test at Vermilion, Fremont was susceptible while North Dakota 52, Crown and Novelty were partially resistant.

Sask. -

Specimens sent from the Dominion Experimental Station, Swift Current were affected with wilt, but the extent of the damage was not reported.

RUST - Melampsora Lini (Pers.) Desm.

Traces of rust were reported from Saskatchewan.

SUNFLOWER

WILT - Sclerotinia Sclerotiorum (Lib.) de Bary.

Alta. -

Observed on sunflower. Caused some damage.

Sask. -

Caused the death of a dozen plants in a small planting on the Experimental Station, Rosthern.

Que. --

Four per cent infection observed in one field at Ste. Anne de la Pocatiere. The disease did not seem to spread rapidly this year. Infected plants were very scattered.

N. B. - Slight infection was reported in York county.

N. S. -

The disease was present in 2 fields at Hortonville, infection being trace and 5% respectively. This disease was found only in Kings county. Not over 2 per cent of the plants were affected in any one field except at Kentville.

Sunflower.

RUST - Puccinia Helianthi Schw.

Sask. -

Traces of the aecial stage were reported from Indian Head and Saskatoon, on July 2 and July 16 respectively. Only a trace of the uredinial stage was present on Aug. 23 at Indian Head.

N. B. -

Slight infection recorded for York county.

N. S. -

Rust was present on Mammoth Russian at the Experimental Station, Kentville.

LEAF SPOT - Septoria Helianthi Ell. & Kellerm.

Alta. -

This leaf spot was collected at Edmonton.

N. S. -

This disease was prevalent on several pure lines and varieties of sunflower.

DOWNY MILDEW - Plasmopora Halstedii (Farl.) Serl. & de Toni.

This disease was observed at Hortonville, N. S., where the diseased plants were very dwarfed and stunted. About one per cent of the plants were infected. This is the first report of the disease from Nova Scotia.

CHLOROSIS - Cause unknown.

A chlorosis of sunflower was observed at Melfort and on the Experimental Station, Rosthern, Sask., by R. C. Russell. The symptoms as described by him are as follows:-

Rosthern - Some plants were stunted to half the average height of the healthy and were entirely chlorotic. Others were only partially chlorotic and slightly or not at all stunted, chlorosis being largely confined to the upper leaves. Roots were normal.

Melfort - In addition to the above symptoms some of the chlorotic plants were dead and in some cases one side of a plant or a leaf was chlorotic while the remaining portion was green.

CULTIVATED GRASSES.

Awnless Brome (Bromus inermis).

Ergot (Claviceps purpurea (Fr.) Tul. was found at Cardston, Alta.

Cultivated Grasses.

Broom Millet (Panicum miliaceum).

Smut (Sporosporium Panic-milacei (Pers.) Takah.) A trace of this smut was observed at Indian Head, Sask.

Sudan Grass (Holcus Sorghum sudanensis).

Bacterial leaf spot (Bacillus Sorghi Burr.) was collected at Edmonton, Alta.

Timothy (Phleum pratense L.)

Stem rust (Puccinia graminis Pers. var Phlei-pratenis (Erikss. & Henn.) Speg.) scattered infections of stem rust were observed, especially from Edmonton southward. Less frequent than last year. Caused no loss. Traces of rust were also reported from P. E. I.

Leaf spot (Heterosporium Phlei Gregory) was present in Alberta, but it was of very slight importance.

Western Rye Grass (Agropyron tenerum)

Smut (Ustilago bromivora (Tul.) Fisch.) caused severe damage in small plots at Edmonton and Claresholm, Alta.

Engel (Claviceps purpurea) was collected at Wembley, Alta.

MISCELLANEOUS CROPS

Hemp.

Specimens of hemp affected with a Fusarium were collected at Vermilion, Alta.

Soy Bean.

Mosaic virus was severe in the plots at the Summerland Experimental Station, B. C.

Buckwheat.

Leaf spot (Marasmius vulgomaculans Ph.) was of general occurrence at St. Cesaire, Que.

Vetch.

Leaf spot (Ascochyta sp.) was recorded on vetch at the Experimental Station, Charlottetown, P. E. I.

DISEASES OF VEGETABLE AND FIELD CROPS.

ASPARAGUS

RUST - Puccinia Asparagi DC.

Traces of rust reported from Queens county, P. E. I.

DAMPING OFF - Rhizoctonia sp.

Rhizoctonia caused a slight amount of damping off at Fredericton, N. B.

BEAN

MOSAIC - Virus disease.

B. C. -

Mosaic was found on the majority of fields planted to wax beans.

N. B. -

Slight infection was observed in several vegetable gardens in York county

P. E. I. -

Moderate infection was reported in some unnamed varieties in Queens county.

ANTHRACNOSE - Colletotrichum Lindemuthienum (Sacc. & Magn.)
Tri. & Cav.

Sask. -

Five to ten per cent of the plants were infected in a garden at Saskatoon.

Que. -

The disease was frequently very injurious. Serious outbreaks were reported at Ste. Genevieve and Lac de Vincennes, where a reduction in yield of 75 per cent occurred. At St. Augustin there was a loss of 50 per cent in a half acre field. The disease was also fairly prevalent south of Montreal.

N. B. -

Anthracnose was common, but not severe.

P. E. I. -

All the varieties in the experimental plots at Charlottetown were infected.

Bean.

BACTERIAL BLIGHT - Pseudomonas Phaseoli E. F. Sm.

Ont. - Beans affected with bacterial blight were sent from Cornwall for examination.

Que. - This disease was reported as quite general at Vercheres. The damage was confined to the low spots.

N. B. - Slight occurrence of the disease was reported.

P. E. I. - A trace only of bacterial blight was observed on an unknown variety.

MISCELLANEOUS DISEASES

WILT - Botrytis cinerea Pers.

Only isolated specimens were observed on the Experimental Farm, Fredericton, N. B.

STEM ROT - Rhizoctonia Solani Kühn.

Common in gardens in Queens county, P. E. I.

WILT - Sclerotinia Sclerotiorum (Lib.) de Bary.

Slight occurrence in N. B.

BEET

LEAF SPOT - Cercospora beticola Sacc.

N. B. - Slight infection reported.

N. S. - General but light infection observed in a market garden of 3 acres. Apparently the disease was causing little injury.

P. E. I. - General throughout the province, but not important.

SCAB - Actinomyces scabies (Thax.) Gussow.

N. B. - Isolated cases only were observed.

P. E. I. - Traces were found in gardens near Charlottetown. Probably general over the province.

CABBAGE

CLUB ROOT - Plasmodiophora Brassicae Ber.

B. C. - Club root caused considerable loss to the cabbage crop at Armstrong. Infection, however, was much less severe than in 1928. The marked reduction in the amount of the disease was attributed to the soil being unusually dry this year, while last year the land was flooded and the soil exceptionally wet.

Que. -

The disease was prevalent in 5 home gardens at Ste. Anne de la Pocatière. It was specially severe in one, where 90 per cent of plants were so badly infected that they were a total loss. The same was true of about an acre field in St. Johns.

N. B. -

Severe infection of seedling plants was reported. These plants were rendered unfit for transplanting into the field. The disease was severe in the field in all infected areas.

BLACK ROT - Pseudomonas campestris (Pamm.) E.F.Sm.

The disease was observed at St. Etienne des Grès, Que., in plants uncult from an early crop. About 50 per cent of these plants were destroyed which represented about 10 per cent of the $\frac{1}{2}$ acre plot.

Black rot was also observed at Ottawa, Ont.

SOFT ROT - Facillus carotovorus L. R. Jones.

A slight amount of soft rot occurred in York County, N. B.

CARROT

SCLEROTIAL ROT - Sclerotinia Sclerotiorum (Lib.) de Bary.

This rot was serious in stored carrots at Kentville, N. S. Up to 70 per cent of the carrots were destroyed.

BLACK ROT - Alternaria radicina Meier, Drechsler & Eddy.

The disease was observed on specimens from a local grocery store in Fredericton.

CAULIFLOWER

CLUB ROOT - Plasmodiophora Brassicae Wor.

In a half acre field in St. Johns, Que. about 60 per cent of the plants were affected. The diseased plants produced no heads. Moderate infection of cauliflower was also reported from N. B.

SOFT ROT - Bacillus carotovorus L. R. Jones.

Slight amount of soft rot was reported in York county, N. B.

CELERY

LATE BLIGHT - Septeria Apii Chester

Que. -

Late blight is sometimes severe in Que. On the island of Montreal the disease was quite general, but it was often very well controlled. In Abord à Plouffe, slight infection occurred generally over a 6 acre field except in about half an acre where the loss was estimated to be 50 per cent. In another field of about a fifth of an acre, the crop was a total loss. This celery was neither sprayed nor dusted. At Cap Rouge a loss of 90 per cent occurred in a small plot.

N. B. -

Moderate infection was reported.

P. E. I. -

The disease was observed at Charlottetown, but it was of no importance this year.

CUCUMBER

MOSAIC - Virus disease.

Ont. -

A serious outbreak of mosaic occurred at Beamsville. About 40 per cent of the plants were infected in a fairly large block.

Que. -

In a 3 acre field in Abord à Plouffe about 2 per cent of the plants were affected. Loss was slight.

P. E. I. -

Mosaic was common at the Experimental Farm, Charlottetown.

FRUIT SPOT (SCAB) - Cladosporium cucumerinum Ell. & Arth.

Que. -

Around Montreal the disease was found in nearly every

field. In Ste. Flore a loss of 50 per cent occurred in 1-10 acre field. In Abord à Plouffe fruit spot was very severe in a 3 acre field; about 75 per cent of the fruits attacked. In Three Rivers a $\frac{1}{2}$ acre field of pickling and table cucumbers was almost a total loss.

N. B. -

Fruit spot was less severe than 1928. One field showed a loss of 25 per cent.

BACTERIAL WILT - Bacillus tracheiphilus E.F.Sm.

Ont. -

About 75 per cent of the plants infected in a small plot of a few hundred plants at Beamsville.

Que. -

Affected plants were sent in for examination from one grower in the Montreal district.

N. B. -

Isolated cases of wilt were observed in York county.

ANTHRACNOSE - Colletotichum lagenarium (Pass.) Ell. & Holst.

Anthracnose caused slight injury in a greenhouse in Cape Breton, N. S. Lesions were present on both leaf and fruit.

EGG PLANT

WILT -

About 40 per cent of the plants affected in plot of 2500 plants at Jordan, Ont. Verticillium and Fusarium were isolated from the diseased plants. Three small infected areas were also observed in another field of about 5000 plants.

LATE BLIGHT - Phytophthora infestans (Mont.) de Bary.

Late blight was recorded once on the Experimental Farm, Charlottetown, P. E. I.

HORSE-RADISH

PALE LEAF SPOT - Rumularia Armoraciae Fuck.

Slight infection was reported in York county, N. B.

JERUSALEM ARTICHOKE

WILT - Sclerotinia ? Sclerotium (Lib.) de Bary.

Wilt caused a very slight amount of damage to Jerusalem artichoke in N. B.

LETTUCE

DROP - Sclerotinia Sclerotiorum (Lib.) de Bary.

This disease was only slightly prevalent in areas where lettuce is grown intensively in N. B.

GREY MOULD - Botrytis cinerea Pers.

Grey mould was only slightly prevalent in isolated localities in N. B.

TIP BURN - Non-parasitic.

Wherever head lettuce was grown in the Okanagan Valley, B. C., the damage from tip burn was as severe as usual.

CANGEL

BLACK LEG - Phoma Betae (Oud.) Frank.

A serious crown rot due to this organism developed on a series of fertilizer-lime plots at the Experimental Station, Kentville, N. S. The soil that was most favourable for the development of the crop appeared also to favour the disease.

STORAGE ROT - Corticium Solani (Prill. & Del.) Bourd. & Galz.

A serious rot occurred in storage at the Experimental Station, Fredericton, N. B. Rhizoctonia was found to be constantly associated with the trouble.

MELON

BACTERIAL WILT - Bacillus tracheiphilus E.F.Sm.

Bacterial wilt was serious in about an acre planting at Beamsville, Ont; about 20 per cent of the plants were affected. Diseased plants were also received from Renfrew.

ONION

SMUT - Urocystis Cepulae Frost.

About 85 per cent loss resulted from onion smut in 2 acre field at Rosemount, Que.

NECK ROT - Botrytis Allii Munn.

Losses from neck-rot were greater this year than last in Okanagan Valley, B. C. Rain interfered somewhat with the harvesting of the crop while in 1928 the autumn was exceptionally dry and ideal for the curing of the crop.

This disease was reported as occurring commonly on red varieties at Charlottetown, P. E. I.

BULB ROT - Fusarium sp.

In British Columbia Fusarium bulb rot has not been found outside the Kelowna district. In this district the disease

Onion.

has gradually spread each year to new fields and most of the land used for onion production is now infected with the pathogen. A loss as high as 50 per cent has occurred in some fields

MACROSPORIUM ROT - Pleospora herbarum (Pers.) Rabh.
(Macrosporium parasiticum Thüm.)

The perfect stage was collected Apr. 26 at Macdonald College, Que., on dead seed stalks of the onion. The asci were just maturing. The imperfect stage began to appear on the onion seed stalks on Aug. 12 and it spread rapidly in the next two weeks.

PEA

LEAF AND POD SPOT - Ascochyta Pisi Lib.

Que. -

This disease was found mostly in fields of peas grown for canning purposes at Laprairie, St. Johns and Napierreville. It was fairly prevalent in spots.

N. B. -

Slight but general occurrence. All varieties appeared to be about equally affected.

N. S. -

Moderate infection was reported in a garden at Kentville, N. S.

P. E. I. -

The disease was common in gardens at Charlottetown.

ROOT ROT - Fusarium spp.

A destructive root rot of canning peas occurred in the 3 counties, Laprairie, Napierreville and St. Johns, Que. Losses up to 90 per cent occurred in some fields. It is thought the disease is caused by Fusarium spp.

ROOT ROT - Pythium sp.

A root rot caused by a Pythium is reported as local in Moncton, N. B.

POWDERY MILDEW - Erysiphe Polygoni DC.

N. B. -

Powdery mildew occurred commonly, but the infection was light.

Pea.

P. E. I. -

It is reported as very common at Charlottetown.

POTATO

The observations on potato diseases here reported were obtained by the potato inspectors, during their examination of fields of potatoes grown from certified seed stock. As the various diseases must be kept down to very narrow limits for the seed to pass inspection, far greater effort is made to control them in certified stock than in the ordinary potatoes produced for table use. In consequence if any disease is reported as serious in certified seed, it is probably still more destructive in the general crop.

In 1929 about 6 per cent of the acreage devoted to potatoes in Canada was used for growing certified seed. In P. E. I. over 50 per cent of area in potatoes was inspected; in N. B. approximately 6 per cent; in B. C. over 2 per cent and in the other provinces the acreage averaged around 1 per cent. It is also worth noting that 70 per cent of the total acreage in certified seed potatoes is located in P. E. I.

Fields planted with certified seed failed to pass inspection for several reasons. Mosaic was responsible for 50 per cent of the total rejections. The disease was most prevalent in Green Mountain and Bliss Triumph. Black leg was second in importance being responsible for 8.5 per cent of the rejects. Leaf roll was third with 2.7 per cent. Fifteen and a half per cent were also rejected on account of being adjacent to diseased fields.

LATE BLIGHT - Phytophthora infestans (Mont.) de Bary.

Que. -

The weather was unusually wet during the summer in Quebec. As a result late blight reached epidemic proportions in the last few days of August and the first week of September. It then increased rapidly throughout the province. The losses from tuber rot were considerable.

N. B. -

Late blight caused a slight amount of damage in Restigouche county.

P. E. I. -

Late blight was present in very few instances. In one field where the crop had not been sprayed, 25 per cent of the tubers were infected when they were examined in the early autumn.

Potato

RHIZOCTONIA - Corticium Solani (Prill. & Del.) Bourd. & Galz.
(Rhizoctonia Solani Kuhn.)

B. C. -

Rhizoctonia was common, but not severe in the Okanagan Valley. It was neither as prevalent nor severe as in previous years. It is suggested that the decrease was due to the soil being warmer and drier than usual.

Alta. -

The disease was common and caused the usual damage.

Ont. -

The sclerotia of Rhizoctonia were present in greater numbers than usual.

N. B. -

A moderate amount of Rhizoctonia was present in this province.

P. E. I. -

The disease was quite prevalent on the tubers. The vines died early and some time elapsed after their death before the tubers were harvested. This permitted a greater development of the sclerotia than usual.

EARLY BLIGHT - Alternaria Solani (Ell. & Martin) Jones & Grout.

Que. -

On account of the wet season early potatoes in the Sherrington region suffered considerable damage from early blight.

N. B. -

A slight infection from early blight developed in the southern part of the province.

P. E. I. -

Early blight was present only in isolated districts and there the infection was light. It would seem that this disease is not necessarily more prevalent in a dry season.

COMMON SCAB - Actinomyces scabies (Thax.) Güssow.

B. C. -

Common scab was distributed generally in the Okanagan Valley. The disease was slightly more prevalent than usual.

Alta. -

The disease was common and caused severe damage at several points in the province. Several of the larger lots of potatoes

Potato.

awaiting certification had to be rejected on account of scab. The dry weather appeared to have favoured the disease.

Ont. -

The disease was more prevalent than usual, probably due to the dry weather.

N. B. -

In general common scab caused little damage, but here and there it was severe.

P. E. I. -

The disease was severe in many sections, particularly in those where mussel mud had been used.

MOSAIC - Virus disease.

B. C. -

Mosaic was less prevalent and less severe than in previous years. The symptoms of the disease may have been masked in part by dry weather.

Que. -

The disease appeared to be slightly on the increase.

N. B. -

Infection from mosaic varied from slight to severe. Eighty per cent of the fields that were rejected were refused certification on account of mosaic.

P. E. I. -

The disease was about as prevalent as it was in 1928.

LEAF ROLL - Virus disease.

B. C. -

Infection from leaf roll was limited and slight.

N. B. -

The disease was not as common as usual, infection being slight.

P. E. I. -

The amount of leaf roll was about the same as in 1928.

POWDERY SCAB - Spongospora subterranea (Wallr.) Lagerh.

N. B. -

Slight infections of powdery scab were reported from Restigouche and Gloucester counties.

P. E. I. -

Powdery scab was practically absent.

A tuber of Solanum ?tuberosum, which was found growing wild in the Desert of Les Leones, Mexico and sent to the Division of Botany showed a pustule of powdery scab.

BLACK LEG - Bacillus phytophthorus Appel.

B. C. -

Moderate infection from Black leg was found in the Mel-bowna district.

N. B. -

A slight amount of black leg was present. The disease was not as important as usual.

N. S. -

Black leg was found in abundance in fields of ordinary potatoes in Hastings township.

P. E. I. -

The damage from black leg was negligible.

DRY ROT - Fusarium spp.

Dry rot was present to a moderate extent in N. B. In a small lot of potatoes, which were mostly Green Mountains with a light red potato said to be Early Ohio mixed with them, it was noted that the Green Mountains were badly decayed while the red potatoes were practically free from rot.

FROST INJURY - Non-parasitic.

Ont. -

Heavy losses were experienced from early frosts at digging time, which resulted in still further losses in storage.

P. E. I. -

On account of inadequate storage facilities many growers suffered losses from frost. Either the tubers were frozen causing them to decay, or they were so chilled that net necrosis resulted rendering them unfit for seed purposes.

MISCELLANEOUS DISEASES

LACK OF VIGOUR -

In P. E. I. potatoes which were planted about June 1st were the most vigorous. Fields planted before or after that period failed to produce vigorous plants in several instances. The season was one of the driest on record and contributed materially to this condition. A similar condition was observed in Alberta.

Potato.

SPINDLING TUBER - Virus disease.

The disease was observed in some fields in B. C. A slight amount of spindling tuber occurred in N. B.

SHOE-STRING MOSAIC - Virus disease.

Two plants affected with shoe-string mosaic were observed in an acre field of Green Mountains in Trois Pistoles, Que. The seed had been obtained from P. E. I.

GIANT HILL - Virus disease.

The disease was observed in some fields in B. C.

SEED PIECE ROT - Cause undetermined.

Experiments conducted in B. C. in 1929 tend to show that in low lying, wet, cold soils, cut tubers are more frequently rotted than whole potatoes, which results in a decrease in yield.

PHOMA ROT - Phoma tuberosa. Melh., Rosent. & E.S. Schultz.

This rot follows powdery scab. A considerable amount of this disease has been observed in P. E. I.

ALTERNARIA ROT - Alternaria Solani (Ell. & Martin) Jones & Grout and A. fasciculata (Cooke & Ell.) Jones & Grout.

The disease occurred on a few tubers only at the Experimental Farm, Fredericton, N. B.

SILVER SCURF - Scandoloboladium atrovirens Harz.

A moderate amount of infection was present.

NET NECROSIS - Cause unknown

A slight amount of net necrosis was reported in York county, N. B.

HOLLOW HEART - Non-parasitic.

A slight amount of the disease was present in oversize tubers of Bliss Triumphs in N. B.

FUSARIUM WILT - Fusarium oxysporum Schl.

The disease was quite common in uncertified stock. Up to 25 per cent of the plants were affected in fields in N. S.

VERTICILLIUM WILT - Verticillium albo-atrum Reinke & Berth.

A single plant found in York county, N. B.

RUBUS

CROWN ROT - Cause undetermined.

Sask. -

A serious crown rot continues to be destructive in Saskatchewan.

At the Dom. Experimental Station, Rosthern, a new crop of rhubarb was set out; the new roots were obtained by cutting up roots taken from the old block. A large percentage of the new plants were dead from crown rot. It is thought that the disease was spread by cutting up diseased and healthy crowns with the same knife.

N. B. -

A crown rot is also reported from Fredericton. Several plants in one garden died from the disease.

LEAF SPOT - Phyllosticta straminea Bres.

Traces of this leaf spot were observed in P. E. I. It was present generally in Rosemount township, Que., but it caused no loss.

LEAF SPOT - Ascochyta Rhei Ell. & Ev.

This leaf spot was found in gardens at Charlottetown, P. E. I.

MOSAIC - Virus.

Observed in Queens county, P. E. I. The symptoms were very striking.

SALSIFY

WHITE RUST - Cystopus cubicus (Strauss) de Bary.

The disease was very severe on two 50 foot rows in Neuville township, Que.

SPINACH

DOWNY MILDEW - Peronospora effusa (Grev.) Rabh.

Que. -

Large fields of spinach were entirely destroyed. The loss was very heavy.

P. E. I. -

The disease was very scarce this year. It was found in only one garden.

SUGAR BEET

SCAB - Actinomyces scabies (Thax.) Gussow.

Specimens received from Armstrong, B. C., were severely affected.

Sugar Beet.

BLACK LEG - Phoma Betae (Oud.) Frank.

The disease was present on specimens from Armstrong, B. C.

ROOT ROT - Cause undetermined.

A root rot, the cause of which is unknown, was prevalent in the Raymond district, Alta.

HOLLOW HEART - Non-pathogenic.

Hollow heart was present on sugar beets received from Armstrong, B. C.

TOBACCO

BLACK ROOT ROT - Thielavia basicola Zopp.

Que. -

Although this disease is quite general in the tobacco districts the damage was less than in 1928.

Ont. -

The damage was less than usual due to the hot dry mid-summer. The Dark and Burley varieties, which are grown on the heavier soils were most seriously affected. Practically no black root was observed in the Norfolk section.

WILDFIRE - Pseudomonas Tabacum (Wolfe & Foster) Stev.

Shortly after transplanting, an outbreak of wild fire occurred in Lakelse Valley, Que. The disease was checked by the drought and very little damage resulted. No wild fire was observed in Ont. or B. C.

ANGULAR LEAF SPOT - Pseudomonas angularata (Fromme & Murray) Stev.

Que. -

Tobacco of the Belge variety seemed more seriously affected than any other grown in Que. Very little damage was done to the cigar tobacco.

Ont. -

Infection by angular leaf spot was only about one third as heavy as it was in 1928.

MOSAIC - Virus.

Damage from mosaic was very slight throughout all the tobacco districts, except in B. C.

DAMPING-OFF - Pythium de Baryanum Hesse.

Damping-off was very common in a section north of the

St. Lawrence River, Que. due to heavy watering and insufficient ventilation of the seed beds.

NUTRITIONAL DISTURBANCES

No cases of sand drown, drought spot or potash starvation were noted.

MISCELLANEOUS DISEASES.

Ont. -

No frenching, curly dwarf, sore skin, hollow stalk or leaf drop were observed.

Que. -

Only a few isolated cases of frenching, hollow stalk brown root rot were noted.

B. C. -

Leaf drop was observed again in the Okanagan Valley.

TOMATO

YELLOWS - Virus disease.

Yellows was more prevalent than it has been in previous years in the Okanagan Valley, B. C. Although it is present every year, it rarely produces any severe losses.

MOSAIC - Virus disease.

B. C. -

The disease was found on plants in the greenhouse and the field in the Okanagan Valley, but in all cases infection was very light.

N. B. -

Mosaic was widespread, but infection was very light,

P. E. I. -

Mosaic was observed twice. Very slight amount was present in either case.

LEAF SPOT - Septoria Lycopersici Speg.

Ont. -

Plants of Chalk's Jewel showed slight infection at Burlington and Bronte at the time they were being set out where they had not been sprayed. Infection was still light on July 1.

Tomato.

N. B. -

Infection was light and infrequent.

P. E. I. -

Moderate infection occurred in the experimental plots at Charlottetown.

EARLY BLIGHT - Alternaria Solani (Ell & Martin) Jones & Grout.

Que. -

Early blight was present in Laval and Deux Montagnes counties. It also occurred on the fruit at Macdonald College where it caused a semi-dry, black rot of the calyx-end of the fruit.

P. E. I. -

The varieties, which are grown commonly in the city gardens at Charlottetown, were moderately infected.

BLOSSOM END ROT - Non-parasitic.

B. C. -

The disease was general and more severe than in previous years in the Okanagan Valley.

Sask. -

Blossom-end rot was very severe on tomatoes late in the season at Indian Head though there was very little earlier. Variety Pink was most severely affected, 80 to 90 per cent of the fruit being rotted. This disease was also common and severe about Saskatoon.

Ont. -

Specimens were sent in from Almonte.

Que. -

Blossom-end rot caused a loss of 60 per cent in a garden of about 100 plants at St. Gregoire. The soil appeared to lack in fertility and in humus content. The weather was very dry.

N. S. -

The disease was present in a truck garden at Kentville, N.S.

VERTICILLIUM WILT - Verticillium albo-atrum Reinke & Berth.

About 10 per cent of tomatoes in two large greenhouses in Lincoln county, Ont. were infected. V. albo-atrum was isolated consistently.

Tomato.

BREAKDOWN - Non-parasitic.

During the past season breakdown was again found at Keremos, B.C. in practically all the fields. The disease however was not extensive and losses from it were negligible. A survey of the Okanagan Valley showed that a small percentage of breakdown occurred in all the tomato-growing districts. The disease was less severe than in 1928.

LEAF MOULD - Cladosporium fulvum Oke.

This disease appeared again in some of the greenhouses in the Okanagan Valley, B.C. and it caused a small amount of damage.

TURNIPSTEM AND ROOT ROT - Sclerotinia Sclerotiorum (Lib.) de Bary.

Stecklings were severely girdled by this fungus at Kentville, N. S. Ordinarily the disease is of no consequence. It also caused some decay of turnips in storage at Nappan.

STORAGE ROT - Corticium Solani (Prill. & Del.) Bourd. & Galz.

N. B. -

A slight, general infection of the turnips at the Experimental Station, Fredericton, was observed.

P. E. I. -

This disease caused the destruction of many thousands of bushels of turnips in storage. They break down very rapidly where ventilation is poor (For a description of the disease see Lauritzen, J.I. Rhizoctonia rot of turnips in storage. Jour. Agr. Res. 38: 93-108. 1929).

DRY ROT AND CANCER - Phoma Lingam (Tode) Desm.

This disease was serious in some varieties of swedes at Kentville, N.S. The disease appears to be carried on the seed. However, the fungus apparently lives over also in the soil on the remains of diseased plants.

SOFT ROT - Bacillus carotovorus L.R. Jones.

One per cent of the plants in the variety Bangholms was affected with soft rot at Charlottetown, P. E. I.

CLUB ROOT - Plasmodiophora Brassicae Woron.

Que. -

In a field at New Richmond about 25 per cent of the plants

Turnip

were infected. The disease was also reported from Acton Vale.

N. B. -

Infection from club root was fairly general in all infected soils. Few varieties appear to be immune.

N. S. -

About 5 per cent of the crop in one field in Great Village township were seriously affected with club root. At Princeport another field showed 25 per cent.

P. E. I. -

The disease was observed on all commercial varieties except English at Ch. Plottetown. Club root is quite common where the land has not been "mudded".

WHITE RUST - Cystopus candidus (Pers.) de Bary.

White rust was observed on a few occasions.

WATER ELON

LEAF SPOT - Cercospora sp.

Slight infection observed in Sunbury county, N. B.

DISEASES OF FRUIT CROPS.

APPLE

SCAB - Venturia inaequalis (Cke.) Wint.

B. C. -

In the Kootenay Lake area observations were made on the percentage of fruit infected on unsprayed trees. The results were as follows:-

Gravenstein	76.7	per cent	scabby
Northern Spy	64.6	"	" "
McIntosh	98.7	"	" "

Ascospores were found on spore traps on May 1st and they continued to be discharged intermittently for a period of 39 days when observations were discontinued, conidia then being plentiful. (J.W. Eastham).

In the Okanagan Valley the commercial loss from scab was negligible. The disease is confined almost entirely to the northern sections of the Valley.

Man. -

Only a trace of apple scab was found at the Horticultural Station, Morden. The disease is sometimes fairly common, but no spraying is done to control it.

Ont. -

Apple scab was of considerably less importance than in the previous year. Although the infection was general the season was unfavourable and where the present programme of spraying was carried out the disease was held in check. In the experimental orchard of young trees at St. Catharines the percentage of foliage infection on the unsprayed trees on Sept. 19th was 3 to 24 per cent, while on the sprayed trees infection ranged from $\frac{1}{2}$ to 9 per cent. Infection was first observed on May 13 in Lincoln county. It made its first appearance on the leaves in York, Peel and Walton counties on May 19, and on the fruit (McIntosh) on May 25. Forty per cent of the leaves on unsprayed trees were badly disfigured by scab at Guelph by June 18. In general dry weather in June held the disease in check.

Que. -

In the 20 to 25 orchards visited in the Mount St. Hilaire district 5 to 10 per cent of the fruits were scabby, infection being light, in well sprayed orchards. On the other hand 90 to 100 per cent of the fruits were scabby, being lightly or severely infected, in a few unsprayed orchards. In poorly sprayed orchards the figures ranged between these two extremes.

Apple.

Average infection for all Fameuse and McIntosh apples in this district would be about 50 to 60 per cent.

At Ste. Anne de la Pocatière observations were made on varietal susceptibility. In Fameuse 30 per cent of the fruit were infected, in McIntosh 30 per cent, in Wealthy 25 per cent, and in Duchess 10 per cent. Average infection of all varieties was 55-60 per cent.

The disease was very prevalent in unsprayed orchards along the south shore of the St. Lawrence River in the Montreal region. It was less abundant on the north shore.

N. B. -

Scab was fairly prevalent in unsprayed orchards, but it was of less importance than it has been in the past few years.

N. S. -

Apple scab caused moderate infection on all varieties except Baldwin and Greening, on which severe infection of storage spot developed. In many orchards spray applied between July 15 to 31 prevented the development of storage spot. Scab was found to be general on leaf and fruit in several small farm orchards where the trees were not cared for. The fruit was small and cracked.

P. E. I. -

Apple scab was widespread and, except in a few orchards where they were faithfully sprayed, the apples were unsaleable.

FIRE BLIGHT - Erwinia amylovora (Sacc.) Brev.

B. C. -

Fire blight was not as severe as in 1928 in the Okanagan Valley although conditions were ideal for its spread. It is thought that control measures carried out by the growers was largely responsible for its decrease.

Man. -

Of the diseases of apple, which occur on the Horticultural station at Morden, fire blight is the most destructive. It was not very abundant or destructive this year. Prince and Yellow Transparent were the most susceptible of the varieties grown. Bad cankers occurred on these varieties. In several others spur blight was considerable. In still other varieties no blight was seen. Large cankers only are removed; the small diseased twigs are allowed to remain. Considerable fire blight also occurred at the Agricultural College, Winnipeg.

Ont. -

Fire blight was very bad on some varieties of apples, especially Kings, in Kent and Essex counties. Considerable

loss of fruit resulted.

Que. -

Very heavy damage from fire blight was reported in Central district, chiefly on Alexander. The disease was found to be prevalent on two or three varieties at Abbotsford. About 25 to 30 twigs per tree were blighted and about 250-300 trees were affected. Minor outbreaks were reported from several other parts of the province.

P. E. I. -

The disease is quite serious in uncared for orchards. Ornamental Mountain ash trees at Charlottetown were also affected with fire blight.

BLACK ROT - Physalospora malorum Sheer.

Que. -

The disease was prevalent on some trees of Alexander at Abbotsford, Mt. Johnson and Hemmingford.

N. B. -

Black Rot occurred only slightly in York county. Infections on both fruit and leaves were observed.

N. S. -

The disease was scattered to general in small farm orchards in Pictou and Colchester counties.

PERENNIAL CANKER - Gloeosporium perennans Zeller & Chids.

A survey conducted in the winter 1926-29 showed that perennial canker was established in the Penticton, Summerland, Kaledon and Keremeos districts, B. C. Control measures recommended last spring have kept the disease in check.

MISCELLANEOUS DISEASES

PINK ROT - Trichothecium roseum Link.

Pink rot caused considerable damage where the fruit was scabby in P. E. I. It was of slight occurrence in storage in York county, N. B.

ANTHRACNOSE - Neofabraea malicorticis (Cordley) Jackson

This disease is practically confined to the Salmon Arm district, B. C. Climatic conditions last fall were unfavourable for any serious increase of infection.

POWDERY MILDEW - Podosphaera leucotricha (Ell. & Ev.) Galm.

A light infection of powdery mildew occurred in every

Apple

district in the Okanagan Valley, B. C. It caused a slight reduction in grade owing to the russetting of the fruit.

BITTER PIT - Non-parasitic.

bitter pit was not as prevalent as last year in B. C. It was limited almost entirely to Northern Spy. Considerable bitter pit showed up in storage in N. S. on Baldwin, Northern Spy, Greening and Stark.

CROWN ROT - Cause not known.

This disease is causing an increasing loss of trees in all irrigated sections of the Okanagan Valley, B. C.

WINTER INJURY - Non-parasitic.

Although the winter was more severe than usual very little noticeable injury was observed in the Okanagan Valley, B. C. Winter injury was also reported from Charlesbourg, Que., in a young orchard with sod cover exposed to prevailing west winds. Little new growth was made, the trees were stunted and bushy with light-green leaves.

INTERNAL BREAKDOWN - Non-parasitic.

Although internal breakdown was still general and serious especially in Jonathan in the Okanagan Valley, B. C., there was a marked decrease in loss of fruit in 1929. Internal breakdown was also found in many varieties in N. S. It was thought that the outbreak was due to the drought of the past summer.

DROUGHT SPOT, DIE-BACK and CORKY CORE - Non-parasitic.

These three diseases are evidently on the increase in Okanagan Valley, B. C. The loss in fruit from these diseases in 1929 was much greater than the combined losses from all other diseases.

Corky core was also observed in Wageners in N. S. The surface of the fruit was somewhat wrinkled resembling aphid apples.

JONATHAN SPOT - Non-parasitic.

A small amount of Jonathan spot was observed at the Experimental Farm, Fredericton, N. B. in March. The disease is not common.

EUROPEAN CANKER - Nectria galligena Bres.

This canker was observed to a limited extent in Restigouche county, N. B. on Fameuse.

TWIG BLIGHT - Nectria cinnabarina (Tode) Fr.

This fungus was found constantly on Ben Davis, Gano and Rome Beauty twigs in N. S. It caused a die-back from the fruit spurs. The fungus apparently gained entrance through old apple stems which had remained attached to the fruiting spurs.

SILVER LEAF - Stereum purpureum Fr.

Only three trees were found affected with silver leaf in the main orchard, Horticultural Station, Morden, Man. Two of these trees were, however, dying from the disease. The disease was also reported from Nappan, N. S. and York county, N. B.

BLUE MOULD - Penicillium expansum Thom.

This mould is reported to have caused a small loss in storage in N. B.

BROWN ROT - Sclerotinia americana (Worm.) Mort. & Ezekiel.

This rot was of slight occurrence in N. B. It was also of no importance in the Niagara peninsula in Ontario.

FRUIT SPOT - Phoma pomi Pass.

A slight amount of fruit spot occurred in N. B.

STIPPIN - Non-parasitic.

This disease was common on many varieties in N. B.

APRICOT

RUSSETING - Non-parasitic.

Russeting was prevalent in all parts of the Okanagan Valley, B.C. and is decidedly on the increase. It would appear that the disease is closely related to drought spot of apple.

BLACKBERRY

ORANGE RUST - Gymnoconia Peckiana (Howe) Trotter

Ont. -

The rust was common on both cultivated and wild varieties

Blackberry

in Halton, Peel and York counties.

Que. - The disease was locally serious in the Abbotsford district.

N. S. - In one plantation of the Snyder variety in King's county 2 to 3 per cent of the plants were affected. Specimens of the rust on the same variety were received from Annapolis county.

CHERRY

SHOT HOLE - Coccomyces hiemalis Higgins
(Cylindrosporium hiemalis Higgins)

Ont. - Fifty per cent of the leaf surface was destroyed by June 3, in Halton and Peel counties on sweet cherries (mostly Windsors) where the trees had not been sprayed or where the spraying was poorly done. The disease was also bad in the previous two years in Kent and Essex counties. Premature defoliation by this disease along with some unusually cold weather in the winter resulted in the death of many sour cherry trees. In the Niagara peninsula the disease was of no importance in 1929 although it had been serious the two previous seasons.

N. B. - A moderate amount of shot hole was present in York county.

N. S. - The disease was very prevalent on sour cherry trees that had not been sprayed, causing 25 per cent of the leaves to fall. It was well controlled on sprayed trees.

P. E. I. - Shot hole caused considerable defoliation. The trees are not sprayed.

DROUGHT SPOT - Non-parasitic.

Drought spot of cherry was observed in the Okanagan Valley, B. C., but it is of minor importance. The disease was neither widespread nor severe.

WITCHES' BROOM - Taphrina Cerasi (Fuck.) Sadeb.

One case of witches' broom was observed at Maguerville, N.E.

Cherry

BROWN ROT - Sclerotinia americana (Worm.) Nort. & Eziekiel.

Brown rot in sweet cherries caused considerable loss in 1928 in Kootenay Lake area, B. C. It was not found in 1929.

At the Horticultural Station, Vineland, Ont., the disease was relatively scarce and unimportant this year. In many cases over-ripe fruit remained on the trees for as long as 2 weeks with very little infection developing.

The fruit from 3 large trees of wild black cherry (Prunus serotina) was a total loss due to brown rot at St. Etienne des Grés, Que.

CURRENT

WHITE PINE BLISTER RUST - Cronatium ribicola Fischer.

Ont. -

The rust was less abundant than usual in York, Wellington, Peel and Halton counties.

Que. -

The rust was reported on black currants from Oka and Mascouche.

N. B. -

The disease was severe on currants at the Experimental Farm, Fredericton.

N. S. -

All the bushes in small garden plantations in Pictou and Colchester counties, where observations were made, were severely infected. Considerable defoliation resulted. Also reported from Inverness county.

P. E. I. -

The rust was general wherever currants were cultivated. The disease is also common now on white pine.

LEAF SPOT - Pseudopeziza Ribis Aleb. (Gleosporium Ribis (Lib.) Mont. & Desm.)

Ont. -

The disease was very common in spite of dry weather in Wellington, York, Peel and Halton counties.

N. S. -

Practically all leaves on bushes in a small garden at Middle Stewiacke were infected.

P. E. I. -

Currants were moderately infected, with this leaf spot wherever they are cultivated.

LEAF SPOT - Mycosphaerella Grossulariae (Fr.) Lind
(Septoria Ribis Desm.)

Ont. -

Septoria leaf spot was very common in Wellington, York, Peel and Halton counties although the weather was dry.

P. E. I. -

This disease was very common on cultivated currants at the Experimental Farm.

POWDERY MILDEW - Sphaerotheca mors-uvae (Schw.) Berk.

A slight amount of powdery mildew occurred on currants in York county, N. B.

GOOSEBERRY

WHITE PINE BLISTER RUST - Cronartium ribicola Visck.

It was reported that the disease had been noticed for several years on cultivated gooseberries at Wakeham, Gaspé Co., Que.

Severe infection occurred on bushes within 100 yards of infected pines at Peterville, N. B.

Scattered infection occurred on all bushes in a garden at Middle Stewiacke, N. S.

POWDERY MILDEW - Sphaerotheca mors-uvae (Schw.) Berk.

Specimens affected with powdery mildew were submitted from Ste. Theodosie, Que.

Slight infection of this disease occurred in York county, N. B.

CLUSTER CUP RUST - Puccinia Pringsheimiana Hleb.

A fairly heavy infection was seen in the University garden, Saskatoon, Sask.

The fruits were found infected to a considerable extent at Annapolis, N. S. Leaf infections were also noticed on both wild and cultivated species on several occasions.

LEAF SPOT - Pseudopeziza Ribis Kleb. (Gloeosporium Ribis
(Lib.) Mont. & Desm.)

A slight infection of this leaf spot was reported from York county, N. B.

LEAF SPOT - Lycosphaerella Grossulariae (Fr.) Lind.
(Septoria Ribis) Desm.)

Septoria leaf spot was common in the gardens of Charlottetown,
P. E. I.

GRAPE

POWDERY MILDEW - Uncinula necator (Schw.) Burr.

This disease was of little significance in the Niagara peninsula, due no doubt, to the extremely dry weather. A heavy infection was observed in one vineyard of Concords bordering on Lake Ontario, where heavy fogs had prevailed and the vines had not been sprayed.

A trace of this disease was observed at Kentville, N. S.

DOWNY MILDEW - Plasmopora viticola (Berk. & Curt.)
Berl. & de Toni.

Downy mildew was similarly of little importance in the Niagara peninsula, due to the dry weather.

DEAD ARM-Cryptosporella viticola Shear. (Fusicoccum viticolum
Redd.)

The disease appeared to be more abundant than usual in the Niagara peninsula. This may have been due to the excessive moisture of early spring followed by a sudden change to dry weather, which seemed to exaggerate leaf symptoms. In a vineyard in Pelham township 5 per cent of the vines showed dead arm.

BLACK ROT - Guignardia Bidwellii (Ell.) Viola & Ravaz.

In a vineyard at Beamsville, Ont., a general but light infection was observed, about 8 to 10 per cent of the fruit being affected.

PEACH

LEAF CURL - Taphrina deformans (Berk.) Tul.

B. C. -

Where the trees were sprayed the disease was found of no importance in the Okanagan Valley.

Ont. -

Leaf curl was unusually prevalent and severe. Complete defoliation was not uncommon. The Ont. Spray Service Records

Peach

showed that the disease was very serious in orchards which were sprayed later than Apr. 11 or thereabouts. In many instances spray had not been applied as it was impossible to get on the land by that date. The disease also was prevalent in Halton and Peel counties and about London.

SCAB - Cladosporium carpophilum Thüm.

Scab was of much less importance than in the previous two seasons in the Niagara peninsula of Ontario. Infection appeared late and although the fruit developed some scab little became deformed and cracked. In a Jordan orchard scab was very serious on St. Johns. Although the trees had been sprayed twice they were in a very sheltered location. Alberta was much less heavily attacked. Infection was general but light on Admiral Dewey and St. John in another orchard at the same place. The trees had been sprayed twice, but the orchard was in a sheltered location.

BROWN ROT - Sclerotinia americana (Worm.) Mort. & Eschiel.

Apothecia were found abundantly developed in an uncultivated peach orchard on May 24 at Vineland, Ont. The disease was of no importance either as blossom blight or a fruit rot in the Niagara peninsula. The dry weather apparently held the disease in check.

DROUGHT SPOT - Non-parasitic.

This disease was severe in only a few orchards in the Okanagan Valley, B. C.

PEAR

SCAB - Venturia pirina Aderh. (Fusicladium pirinum (Lib.) Buck.)

Ont. -

In an orchard at Beamsville 60 per cent of the fruit of Flemish Beauty were infected, while fully 15 per cent were not marketable. These trees had been sprayed at least 3 times, while adjoining rows of Bartletts, which had been sprayed twice (dormant and calyx), were clean.

Que. -

Scab was found everywhere south of Montreal. Even where the trees had been sprayed there was a high percentage of infection at Covey Hill, Franklin Centre and Abbotsford.

P. E. I. -

Trees were moderately infected at Charlottetown.

FIRE BLIGHT - Bacillus amylovorus (Burr.) Trev.

B. C. -

Fire blight was general throughout the Okanagan Valley, but the disease has been kept under control and serious losses have been prevented.

Ont. -

Fire blight was of no importance in the Niagara peninsula.

Que. -

The disease was of little importance. It was observed at Abbotsford and Franklin Centre.

P. E. I. -

It was observed in one orchard near Charlottetown.

POWDERY MILDEW - Podosphaeria leucotricha (Ell. & Ev.) Salm.

The disease was not as severe as it has been in past seasons, in the Okanagan Valley, B. C.

DROUGHT SPOT - Non-parasitic.

Drought spot was prevalent and fairly severe in all parts of the Okanagan Valley, B. C. It appears to be increasing on younger pear trees where poor drainage conditions have resulted from irrigation on heavier soil types.

BLOSSOM-END ROT - Cause unknown.

The disease was slightly more prevalent in several districts of the Okanagan Valley, B. C.

PLUM

PLUM POCKETS - Taphrina Pruni (Fuck.) Tul.

Sask. -

Approximately 10 per cent of fruit were destroyed in the orchard at the Experimental Farm, Indian Head.

Man. -

Plum pockets is confined to the native selections of Prunus nigra and P. americana at Horticultural Station, Morden, Man. Probably most of the selections are of the latter species. Ten per cent of the fruit were affected. Spray has never been applied. At the Agricultural College, Winnipeg, 5 to 10 per cent of the fruit were affected on the native selections. The disease was epidemic in 1927 when spraying was omitted. The disease has been well controlled by spraying.

Plum

Ont. -

Specimens of plum pockets from cultivated plums were received from Britannia and North Bay.

Que. -

Although the disease was observed at Abbotsford it appears to be worse in eastern Que. The fruit was a total loss in small gardens at St. Sulpice and St. Etienne des Grès. Sixty to seventy-five per cent of the fruits on wild plums in Ste. Genevieve were destroyed by plum pockets.

BLACK KNOT - Diobotryon morbosum (Schw.) Theiss. & Syd.

Sask. -

From observations made at Dana, where choke-cherry (Prunus virginiana) and pin cherry (P. pennsylvanica) were found growing together, it appears that choke-cherry is much more susceptible than the other host. The galls on the former were more abundant, much larger, and they frequently occurred on the main shoots or larger branches, killing that portion above the knot. Black knot on pin cherry is rather difficult to find and the knots are confined to the smaller twigs. The disease was also common on choke cherry at St. Gregor and Humboldt.

Man. -

At Morden, Man. black knot was found to produce numerous large galls on the May Day tree (Prunus Padus var. commutata). At Winnipeg it was noted that the choke cherry was much more severely affected than the native plum.

Ont. -

Black knot was quite general throughout the Niagara peninsula. Lombard was commonly affected. The disease is common in unsprayed orchards in the mixed farming districts of York, Halton and Peel counties. Few trees are affected in the fruit sections.

It was also collected on choke cherry at Rainy River.

Que. -

Black knot apparently killed plum trees at Ste. Genevieve. It was also observed at St. Hilaire and Lacelle.

N. B. -

The disease was reported to occur to some extent. Pin cherry was found to be slightly infected.

P. E. I. -

The disease was very common all over the province and it has been responsible for the complete destruction of excellent orchards.

In view of the differences of susceptibility of the above hosts it is of interest to note their systematic position. According to Rehder (Manual of cultivated trees and shrubs), they may be classified as follows:-

Subgenus Prunophora, section Euprunus - Prunus domestica, some varieties very susceptible; section Prunocerasus - P. nigra and P. americana slightly susceptible; Subgenus Cerasus, section halab - P. pennsylvanica slightly susceptible. Subgenus Padus - P. Padus var coarctata and P. virginiana very susceptible. Physiologic specialization has also been reported.

BROWN ROT - Sclerotinia americana (Worm.) Hort. & Ezekiel.

Ont. -

No importance in 1929 in the Niagara peninsula.

N. B. -

Moderate amount of brown rot occurred in York county.

P. E. I. -

Brown rot did considerable damage. It was found in all unsprayed orchards.

SCAB - Gladosporium carpophilum Thüm.

Scab was reported as common in Carleton county, N. B.

Raspberry

MOSAIC and LEAF ROLL - Virus diseases.

B. C. -

Mosaic was general in the Okanagan Valley.

Ont. -

Mosaic appeared to be very common on wild raspberries in Halton, Peel and York counties. Many plantations of cultivated raspberries are free from mosaic, while others show 8 to 10 per cent of the plants infected. Mosaic has never been seen on Viking. (W.G. Evans).

In the Niagara peninsula the prevalence of mosaic and leaf roll remains about the same as in previous seasons. They are commonly found in commercial plantations. At Beamsville in an half acre planting of Herberts about 6 years old and never rogued, 50 per cent of the plants were affected with mosaic and 5 per cent with leaf roll. The yield was already unprofitable and the planting must be replaced.

N. B. -

Mosaic is fairly prevalent, while leaf curl is common on both cultivated and wild varieties.

Raspberry

N. S. -

In a planting of Viking at Kentville, 10 per cent of the plants were infected with mosaic. Adjacent Herberts were free from the disease. Viking is apparently extremely susceptible under local conditions.

P. E. I. -

Mosaic occurred in all plantations irrespective of variety. Viking was only slightly susceptible. Leaf roll was reported from all parts of the province. It was not observed on Viking.

SPUR BLIGHT - Didymella applanata (Missl.) Sacc.

The fungus causing spur blight in North America has usually been referred to as Mycosphaerella rubina (Pr), but Koch has recently shown that it is identical with Didymella applanata, the cause of spur blight in Europe, and the American name should be reduced to synonymy.

Ont. -

Spur blight is very common in Wellington, Peel, Halton and York counties where raspberries are grown in the mixed farming area, all varieties seem to be equally affected.

In the Niagara peninsula there was only about half as much spur blight as in the previous year, when it was exceptionally bad.

Que. -

The ascigerous stage was found on May 26 in a planting in Jacques Cartier county on cankered areas at the base of blighted spurs of two year old canes. (J.E. Machacek).

N. B. -

Spur blight was present to a slight extent.

N. S. -

Some severe infections of spur blight were observed in plantations at Greenwich. Canes were completely girdled near the base.

P. E. I. -

Spur blight was general over the province. It has been responsible for complete destruction of many plantations. Herberts were found badly diseased, while no spur blight was found on Viking.

ANTHRACNOSE - Plectodiscella veneta Burk.

Que. -

Anthracoese was reported as serious in some plantations in Jacques Cartier county.

N. B. -

A small amount of anthracnose was present in York county.

N. S. -

The disease was fairly common in King and Annapolis counties. New infections were showing abundantly on young canes causing considerable cankering of the canes.

LEAF SPOT - Mycosphaerella Rubi Roark
(Septeria Rubi West).

Que. -

The leaf spot caused by the imperfect stage was serious on Herbert at Bedford.

N. S. -

Septoria Rubi was common on the leaves at Digby.
Rhabdospora Rubi was found fruiting abundantly on adjacent blighted canes. This is the first report of the latter fungus for Nova Scotia. Whether these two fungi are identical, as claimed, is not known.

P. E. I. -

Traces of the leaf spot were observed on wild raspberries.

CANE BLIGHT - Leptosphaeria Coniothyrium (Fuck.) Sacc.
(Coniothyrium Fuckelii Sacc.)

Ont. -

Canes bearing the perithecia were numerous in nearly all plantations in Halton, Peel and York counties. Even some of the best growers have not succeeded in cutting it all out. In neglected plantations 50 per cent or more of the canes are diseased.

N. B. -

The disease was present to a slight extent at Moncton.

N. S. -

Cane blight was more prevalent than usual in Kings and Annapolis counties. Considerable blight was found on old fruit canes.

ORANGE RUST - Gymnoconia interstitialis (Schl.) Lagerh.

The rust was quite prevalent on wild raspberries in N. B. It was also observed at several places in N. S. and Que.

BLUE STRIPE WILT - Verticillium ovatum Berkeley & Jackson.

In a half-acre plantation in Welland county, Ont. 3 per cent of the plants were affected. Raspberries had been planted following potatoes, and tomatoes were grown as an interplanted crop.

Raspberry.

CROWN GALL - Pseudomonas tumefaciens
(E.F.Sm. & Towns.) Dugg.

Twenty-five per cent of plants rogued from a nursery plantation for mosaic also were infected with crown gall.

ASCOSPCRA CANE SPOT - Ascospora Rubi Zeller.

The Coryneum stage of this fungus was found readily in a plantation at Digby, N. S. It was associated with cane blight and may have contributed to the loss in many plantings. This is the first report of this disease in Nova Scotia.

ROOT ROT - Fusarium sp.

A rot caused by a species of Fusarium was found in a few black raspberry plants in gardens in the southern part of the Okanagan Valley, B. C.

SAND CHERRY

POWDERY MILDEW - Podosphaera Oxycanthae (DC.) de Bary.

Rather heavy infection of some of the bushes in the University garden, Saskatoon, Sask. Mature perithecia were present on Sept. 29.

STRAWBERRY

LEAF SPOT - Mycosphaerella Fragariae (Tul.) Lindau
(Ramularia Tulasnei Sacc.)

Ont. -

Leaf spot was not as common as usual in Halton, Peel and York counties.

Que. -

The disease was general in the Montreal district.

N. B. -

Leaf spot was present to some extent in York county.

P. E. I. -

The disease was not common this year. Moderate infection of Portia and Premier varieties was observed.

LEAF SCORCH - Diplocarpon Earliana (Ell & Ev.) Wolf.
(Marssonina Fragariae (Sacc.) Kleb.)

N. B. -

Leaf scorch was fairly prevalent, but it is apparently

of little economic importance.

P. E. I. -

The disease was abundant on S.L. Champion, Charles First and Portia. It was not observed on other varieties.

ROOT-ROT - Cause undetermined.

Ont. -

Root rot was quite general and severe in some plantations of the Niagara peninsula. At Vineland in a planting of Parson's Beauty composed of six rows each about 100 ft. in length, 60 per cent of the plants died completely after making a very vigorous growth and beginning to run. The plants had been carefully selected from a healthy patch in the spring.

The disease did not appear to be as bad as usual in Peel, Halton and York counties. It is thought that the long, cool, wet spring and the absence of heavy frosts gave the plants a better chance to recover from the winter. There were a few dead plants at fruiting time.

N. B. -

Root rot was reported as prevalent over the entire province.

POWDERY MILDEW - Sphaerotheca Humuli (DC.) Burr.

Ont. -

In the counties of Halton and Peel, powdery mildew caused very little damage in comparison with 1928. In that year Premier seemed to be less susceptible than Glen Mary.

N. B. -

A slight infection of powdery mildew occurred.

FRUIT ROT - Botrytis sp.

N. B. -

Infection from fruit rot was very slight.

P. E. I. -

Traces of rot were found on Senator Dunlop at the Experimental Farm, Charlottetown.

MOSAIC - Virus disease.

Ont. -

Sixty per cent of the plants were yellow and dying in one planting of Van Dyke in Lincoln county.

N. S. -

In a plantation in Colchester Co. the leaves were badly curled and mottled and the fruit was badly dwarfed.

D I S E A S E S O F F O R E S T A N D S H A D E T R E E S .

A L D E R (Alnus)

CATKIN DEFORMATION - Taphrina Alni-incanae (Kühn) Magn.
Very common on swamp alders in P. E. I.

B A L S A M F I R (Abies balsamea)

NEEDLE BLIGHT - Asterina nuda Peck.

Moderate to severe infections in York county, N. B.
Disease specimens were received from Sault Ste. Marie, Ont.
Identified by Dr. Dearness.

NEEDLE BLIGHT - Sclerophoma sp.

Slight infection in York county, N. B.

WITCHES' BROOM RUST - Melampsorella elatina (Alb. & Schw.) Arth.
Reported from Highbury, N. S.

BUTT ROT - Polyporus Schweinitzii Fr.

General but slight infection in New Brunswick.

B E E C H (Fagus)

WOOD ROT - Fomes fomentarius Fr.

Reported as uncommon in P. E. I.

B I R C H (Betula)

SAPWOOD ROT - Polyporus betulinus Fr.

Common in New Brunswick and Prince Edward Island.

HEART ROT - Fomes igniarius Fr.

Caused considerable damage in second growth birch.

B U T T E R N U T (Juglans)

ANTHRACNOSE - Gnomonia leptostyla (Fr.) Ces. & de Not.

Moderate infection occurred on a number of trees at
Maguerville, N. B.

C O N I F E R S

DAMPING OFF - Cause undetermined.

Damping off has proved troublesome on conifers at
Rosthern, Sask.

E L M (Ulmus)

LEAF SPOT - Gnomonia ulmea (Sacc.) Thüm.

The disease is present in various localities in N. B.
but infection is slight. Not common in P. E. I. The disease

Elm.

was very noticeable in the Eastern Townships and west of Montreal, Que.

ROT - Pleurotus ulmarius Bull.

Observed once on elm in Prince Edward Island.

CANKER - Nectria cinnabarina (Tode) Fr.

Considerable damage was done to elms at Charlottetown, P. E. I.

HORSE CHESTNUT (Aesculus)

LEAF BLOTCH - Guignardia Aesculi (Pk.) V.B. Stewart.

Only isolated specimens were observed in New Brunswick. The disease was general over Prince Edward Island and caused partial defoliation.

LEAF SPOT - Phyllosticta sphaeropsoides Ell. & Ev.

Reported from Ottawa, Ont.

MAPLE (Acer)

DIE BACK - Sphaeropsis albescens Ell. & Ev.

The whole top of a box elder (A. Negundo) was killed back a 2 to 3 feet at Saskatoon, Sask., and the bark of the dead shoots bore pycnidia in abundance. Fungus identified by Dr. Dearness.

LEAF SPOT - Phyllisticta minima (Berk. & Curt.) Ell. & Ev.

A trace of this leaf spot was observed on sugar maple (A. saccharum) in P. E. I.

HEART ROT - Fomes igniarius Fr.

Isolated trees of sugar maple were affected in N. B.

ANTHRACNOSE - Gloeosporium apocryptum Ell. & Ev.

It caused conspicuous disfiguration on the foliage of the ornamental and shade trees (A. platanoides) around a city residence (J. Dearness). It is also reported on sugar maple from P. E. I.

WILT - Verticillium sp.

Wilt was quite prevalent on maple at Coverdale, N. B.

MOUNTAIN ASH (Sorbus)

CANKER - Cytospora chrysosperma (Pers.) Fr.

The disease was observed in York county, N. B. and an affected specimen was received from Quebec City, Que.

PINE - (Pinus).

RUST - Cronartium Comptonae Arth.

Rust infection was present on young trees of jack pine in Sussex, N. B.

STEM CANKER - Ceuthospora sp.

A stem canker caused by Ceuthospora sp. was present on jack pine in York county, N. B. and in the Ottawa Valley in Quebec.

WHITE PINE BLISTER RUST - Cronartium ribicola Fisch.

A brief account of the places where White Pine Blister Rust was found on white pines or on wild Ribes, is here given. These records were obtained from short surveys made by members of the Dominion Laboratories of Plant Pathology or from correspondents, who submitted specimens to the Division of Botany for identification. For the prevalence of rust on cultivated currants see page 49.

Ont.-

A survey for white pine blister rust was conducted in Lincoln county by G. O. Madden. Six of the twenty-eight pine lots visited were found infected with blister rust. These were situated as follows, Ridgeville 2, Fonthill 2, Four Mile Creek 1, and Ball's Falls, near Vineland 1. At all these places the disease was also found on wild currants and gooseberries near infected pines. At the time the survey was made the rust was beginning to appear on cultivated currants, but no effort was made to learn the distribution of the disease on pine from examination of the alternate host. In addition infected pines were received from Renfrew County.

Que.-

Infected pines were received or reported from several places in Quebec with additional comments in many instances as follows:-

Macdonald College - The rust had been found for several years upon Ribes at the college, but this was the first time it was observed in the vicinity on pines. The disease was also abundant on wild currants in the woods.

Lachute - 300 trees have been found infected and removed from an extensive plantation. The Ribes are now being eradicated.

Lakefield - 35 per cent of the trees in a year old plantation were infected with blister rust. Many of the infections were on the main trunk.

Berthier - A few infections have been observed.

Pointe du Lac - Rust has been collected at this place.

Perthuis Seigneurie - Rust was present.

Pine

Lacharite - Twelve four-year-old trees were killed by blister rust.

Kirks Ferry - A tree 6 to 8 feet high was killed by rust.

St. Aubert - About 25 per cent of trees from 1 to 4 inches in diameter were attacked. These trees were located on two rocky hills east of St. Aubert.

Ste. Louise - Rust was found on pines near this place.

Ste. Quesime - About 50 per cent of the trees near St. Quesime were found attacked with rust.

Ste. Lucie de Doncaster, Grand Mere and Lac Brule near St. Agathe. Specimens of the rust on Ribes was also sent from Lac Marois.

N. B. -

A survey trip for white pine blister rust was made through York, Sunbury and Queens counties. Rust was found only at Petersville, where several trees were found infested. The disease was present, however, on wild and cultivated currants in all the three counties. The rust has also been collected on pines at St. Andrews.

N. S. -

As the result of a survey in Nova Scotia, white pine blister rust was found at five places in Kings county, two in Annapolis, four in Colchester and one in Antigonish. In addition rust was found on Ribes at two places in Cumberland County, one in Pictou, one in Cape Breton and two additional places in Colchester.

In addition it was reported that the rust was becoming serious on pine about Kentville. Rust was also observed in considerable abundance on white pine at one place in Pictou county. Black currants near by were badly infected.

P. E. I. -

White pine blister rust was reported as destructive in Queens county.

NEEDLE BLIGHT - Lophodermium brachysporum Rostr.

A slight amount of needle blight of white pine was observed in N. B.

POPLAR (Populus)

BARK CANKER - Hypoxylon pruinatum (Klotzsch) Cke.

This disease was reported from four places in Saskatchewan on Populus tremuloides by R. C. Russell.

Poplar.

Kelliher - Disease was prevalent in several bluffs (groves) of trees in an old pasture. Infection ranged from 0.5 to 15 per cent. These trees were dead or dying.

A small percentage of the trees were dead or dying from bark canker at Naisberry, Poplar Beach, Waken and Hazel Dell. The fungus appears to be highly parasitic and to kill the trees in their prime.

DIE BACK - Fusicladium radiosum (Lib.) Lind.

About five inches of the tips of many young shoots on certain trees near Raymore, Sask., were killed. The affected tips were blackened and curled. Infected leaves were also collected at Manitoba Agricultural College, Winnipeg, Man.

LEAF SPOT - Septoria musiva Peck.

Collected at Beaver Creek, Sask., on P. balsamifera. The spots were small, brown and angular. Identified by Dr. Dearness.

POWDERY MILDEW - Uncinula Salicis (DC.) Wint.

Collected on P. balsamifera at Vonda, Sask. Mature perithecia present.

INK SPOT - Sclerotinia bifrons (Ell. & Ev.) Seaver.

(Sclerotium bifrons Ell. & Ev.)

Collected at Mossisburg, Ont.

LIMB GALLS - Cucurbitaria staphula Dearn.

This disease has been found on Populus balsamifera at Buchanan, Devils Lake, Naisbury and Beaver Creek, Sask., by R. C. Russell. He says: "The site of the original collection, which was made in 1924, was revisited. Many trees which were then infected are still living, except some badly infected branches. A similar disease on the bark of the trunks was also observed. At Beaver Creek a high percentage of the trees in one locality along a creek were more or less heavily infected. Most of the infected limbs were dead, some were dying and a few were still green". The percentage of infection was also high at Naisbury in a similar situation.

BLIGHT - Dothichyza populea Sacc. & H. Briard.

Several trees at the Experimental Station, Kentville, N. S. were almost entirely defoliated.

WOOD ROT - Fomes igniarius Fr.

This rot was very prevalent on native poplars in Queens county, P. E. I.

SPRUCE (Picea)

NEEDLE RUSTS -

The needle rusts of spruce were examined or reported as follows:-

Melampsoropsis ledicola (Peck.) Arth. on black spruce - Lawrence Station, near St. Stephen Highway, N. B. Also on white spruce, Riviere-du-Loup, Que. and on blue spruce (M. pungens) at Experimental Farm, Charlottetown, P.E.I.

Melampsoropsis abietina (Alb. & Schw.) Arth. - slightly prevalent on spruce in Victoria County, N. B. (D. J. MacLeod).

ENGLISH WALNUT (Juglans regia)

CROWN ROT - Cause unknown.

A few trees of Franquette variety were found affected with crown rot at Westbank, B. C.

WILLOW (Salix)

SCAB - Fusicladium saliciperdu (All. & Tub.) Tub.

In Quebec the disease has been very destructive in Gaspé peninsula and Matapedia Valley and is now spreading to Rimouski and Temiscoutata counties. From 10 to 50 or 60 per cent of willows at several places in these latter counties are affected.

In New Brunswick the disease is serious on willows over the entire Province. It is also very destructive in Nova Scotia and Prince Edward Island. Most of the ornamental willows are succumbing to the disease.

RUST - Melampsora Bigelowii Thum.

Light infection at Redberry Lake, Sask.

TAR SPOT - Rhytisma salicinum Fr.

Slight infections observed in N. B.

POWDERY MILDEW - Uncinula Salicis (DC.) Wint.

Mildew was common on willow in Alberta. Also a moderate infection of the swamp willows was reported from Prince Edward Island.

DISEASES OF ORNAMENTALS.

BEGONIA

LEAF SPOT - Cercospora sp.

Leaf spot was very severe at Experimental Station, Fredericton, N. B.

BARBERRY

RUST - Puccinia graminis Pers.

See under Stem Rust of Wheat.

BUCKTHORN

RUST - Puccinia coronata Corda.

See under Leaf Rust of Oats.

CARAGANA

LEAF SPOT - Septoria Caraganae (Jacz.) P. Henn.

A rather heavy infection of leaf spot occurred on the University campus, Saskatoon, Sask. Some bushes appeared to be more susceptible than others.

CARNATION (Dianthus Caryophyllus L.)

RUST - Uromyces Dianthi (Pers.) Niessl.

A small amount of rust was present in a greenhouse in New Brunswick in November. It was found in abundance in greenhouses at Charlottetown, P. E. I. in January.

LEAF SPOT - Alternaria Dianthi Stev. & Hall.

Reported from Iberville, Que.

CHINA ASTER

YELLOWS - Virus disease.

B. C. -

Yellows was present to a very slight extent in the Okanagan Valley.

Alta. -

Plants submitted for examination from Calgary were found to be affected with yellows. All the plants in a block of two thousand were reported to be infected with the disease.

Sask. -

Yellows affected most of the plants in the beds examined at the Experimental Station, Rosthern. The disease was also present at Saskatoon, where in several beds of asters 10 to 15 per cent of the plants were affected.

China asters.

N. B. -

Yellows was extremely severe on all varieties planted at the Experimental Station, Fredericton.

WILT - Fusarium conglutinans Woll. var. Callistophii Borch.

Sask. -

A small percentage of the plants in certain beds at Experimental Station, Rosyth, was affected with disease. It also destroyed several small beds of asters on the University campus, Saskatoon.

Ont. -

Diseased plants were sent for examination from Brockville and East Windsor.

Que. -

Wilt was very common in the Montreal district. It was also serious in other parts of the Province. Fifty per cent of the plants were killed by the disease in a small garden at Port Viau.

N. B. -

Wilt occurred only slightly this year. It was less severe than in previous seasons.

RUST - Colcosporium Solidaginis (Schw.) Thüm.

A slight but general infection developed late in the season at the Experimental Station, Fredericton, N. B.

CHRYSANTHEMUM

YELLOWS - Virus.

A slight amount of yellows occurred in the Experimental Station greenhouse, Fredericton, N. B.

DAHLIA

STEM AND ROOT ROT - Sclerotinia Sclerotiorum (Lib.) de Bary.

The disease caused some loss at Summerland, B. C. It was also reported from Toronto, Ont.

MOSAIC - Virus disease.

Mosaic was a very common disease on the most valuable dahlias at Charlottetown, P.E.I. Several varieties have been discarded on account of mosaic. It is also reported from the Experimental Station, Fredericton, N. B.

ANTHRAX PIPE (Aristolochia Sipho L'Hér).

STEM ROT - Sclerotinia Sclerotiorum (Lib.) de Bary.

Specimens from Lennoxville, Que. are found affected with stem rot.

GERANIUM (Pelargonium)

LEAF SPOT - Cercospora ?Brunkii Ell. & Gall.

A slight infection occurred in the Experimental Station greenhouse, Fredericton, N. B.

GLADIOLUS

BULB ROT - Fusarium sp.

A slight amount of rot occurred at Fredericton, N. B.

The following diseases were found in specimens submitted by correspondents.

Dry Rot - Sclerotium Gladioli Lessey from London, Redmorden and Toronto.

Storage Decay - Fusarium Gladioli McCulloch & Thom. from Salmon Arm, B. C.

Scab - Helotium marginatum McCulloch from Welland, Ont. and Salmon Arm, B. C.

GOLDEN ELOC (Rytidolia)

POWDERY MILDEW - Erysiphe Siphocamparum DC.

Several in gardens at Edmonton, Alta.

ACELERACA

RUST - Puccinia Helvacearum Bert.

Ont. -

Diseased specimens were submitted from Douglas, Hampton and Picton.

Que. -

Rust was general in the Montreal district. It caused serious damage at Chateaugay Basin and on the Island of Montreal.

N. B. -

Rust was widely distributed and infection was severe.

N. S. -

The disease was reported from Montville.

Hollyhock.

P. E. I. -

Rust has been responsible for the destruction of many of our best hollyhocks (R. R. Hurst).

LEAF SPOT - Ascochyta althaeina Sacc. & Bign.

P. E. I. -

This leaf spot was reported as very common on many varieties.

IRIS

LEAF SPOT - Didymellina macrospora Kleb.
(Heterisporium gracile Sacc.)

Ont. -

Diseased specimens were received from Newcastle.

N. B. -

Leaves were moderately infected late in the season, but it is of little economic importance.

P. E. I. -

Leaf spot was very common.

RHIZOME ROT - Bacillus carotovorus L. R. Jones.

Ont. -

Diseased specimens were submitted from Toronto.

N. B. -

One severe case of rhizome rot was observed in Fredericton.

BLIGHT - Botrytis sp.

A blight of Iris caused by a Botrytis was very common after rainy weather in Queens county, P. E. I.

LARKSPUR (Delphinium)

POWDERY MILDEW - Erysiphe Polygoni DC.

Infection was general, but no severe damage was done in New Brunswick. Diseased specimens were also submitted from Sharbot Lake, Ont.

Larkspur.

BACTERIAL BLIGHT - Bacterium Delphinii (E.F.Sm.) Bryan.

The disease was general but slight in York county, N. B. The organism should be referred to the genus Pseudomonas to be in accord with nomenclature here adopted.

LILAC

LEAF BLIGHT - Pseudomonas Syringae van Hall.

Diseased specimens were submitted from Vernon, Ont.

POWDERY MILDEW - Microsphaera Alni (Wallr.) Salm.

Powdery mildew was general but not serious in N. B.

Young shoots and leaves of lilacs were found attacked with Sclerotinia sp. at Ste. Anne de la Pocatière, Que. The shrubs were growing in a low, not unusually damp place. Sclerotia were present on the affected parts.

NARCISSUS

SMOULDER - Botrytis narcissicola Kleb.

Diseased specimens were submitted from New Westminster, B.C.

EEL WORM - Tylenchus dipsaci (Kühn) Bast.

Infected bulbs were sent from Burlington, Ont.

PEONY

BLIGHT - Botrytis Paeoniae Oud.

Diseased specimens were submitted from Meaford and Chesterville, Ont. and Acton Vale, Que.

Blight was present, but it was of no economic importance in N. B.

It was very severe on several varieties causing a wilting of the plants at Kentville, N. S.

Blight was common and destructive about Charlottetown, P.E.I.

LEAF SPOT - Septoria Paeoniae West. var. herolinensis Allesch.

Plants affected with the disease were received from Galt, Ont.

PHLOX

POWDERY MILDEW - Erysiphe Cichoracearum DC.

Diseased specimens were received from Newcastle, Ont.

LEAF SPOT - Septoria divaricata Ell. & Ev.

The disease occurred locally about Fredericton, N. B.

ROSE

BLACK SPOT - Diplocarpon Rosae Wolf. (Actinonema Rosae (Lib.) Fr.)

Black Spot was found in abundance in commercial greenhouses, Niagara-on-the-Lake and East Windsor. The disease was reported on Frau Karl Druschki and Claudius Pernet at Ottawa, Ont.

Black spot was moderately severe at Experimental Station, Fredericton, N. S. It was reported as common on Frau Karl Druschki and Her Majesty at Charlottetown, P.E.I.

POWDERY MILDEW - Sphaerotheca pannosa (Wallr.) Lev.

Powdery mildew was more prevalent than in previous years in the Okanagan Valley, B. C.

Diseased specimens were received from Brookville, Whitby and Ottawa, Ont. It was fairly severe on rambler roses.

Rambler roses were the most seriously attacked in Nova Scotia. Mildew was seen or reported from many parts of the province.

RUST - Phragmidium spp.

Rust was observed on cultivated roses in Alberta. It was common on wild roses.

Rust occurred only slightly in New Brunswick.

Baron de Rothschild was heavily infected with rust causing some defoliation at Charlottetown, P.E.I. It was also common on many other varieties.

INFECTIOUS CHLOROSIS - Cause unknown.

Fifty per cent of the roses in one greenhouse in Ontario were affected with the disease. It was observed in stock from British Columbia only; the disease, however, was general in plants from that source.

A species of Sclerotinia was found attacking a few young rose plants at Neuville, Que.

SNAPDRAGON (Antirrhinum)

RUST - Puccinia Antirrhini Diet. & Holw.

Rusted specimens were received from Hopewell Cape and West St. John, N. B.

SWEET PEA

WILT - Fusarium Lathyri Taub.

Specimens affected with wilt were received from Huntington, Que, and Amherst, N. S. It was reported as destructive in a garden at Charlottetown, P.E.I.

Sweet Pea.

ROOT ROT - Thielavia basicola Zopf.

This fungus caused a severe root rot at Hanoverville, N. S. Specimens were also received from Weymouth, Wolfville and Amherst.

POWDERY MILDEW - Oidiophora diffusa Che. & Peck.

It occurred only slightly in York county, N. B.

MOSAIC - Virus

Isolated cases of mosaic were observed in York county, N.B.

BUD ROT - Non-parasitic.

Bud rot was quite prevalent in York county, N. B.

TULIP

BLIGHT - Betrytis Tulipae (Lib.) Lind.

One thousand bulbs each of Princess Elizabeth and Bartigon, which had been obtained from Holland, were all affected with blight when they were grown at Weston, Ont. Diseased specimens were also received from New Westminster, B. C.

BEANS

ROOT ROT - Fusarium sp.

Twenty-five per cent of the plants in a bed at Experimental Station, Summerland, B. C. were affected with a root rot caused by a species of Fusarium.

DISEASES ON MISCELLANEOUS PLANTS.

The parasitic fungi here reported are from records received from collaborators or from specimens collected and are now being added to the herbarium. Many of collections made in 1929 still remain to be identified, but it is hoped that in time a complete record of each year's additions made be published here as far as the addition adds new information on the distribution or host range of the particular fungus. Fungi new to or rarely collected in Canada will be reported in every case. This list is arranged alphabetically by host.

Agrimonia gryposepala Wallr.

Pucciniastrum Agrimoniae (Schw.) Tranz. Murray Bay, Que.

Agropyron Griffithsii Scribn. & Smith.

Claviceps purpurea (Fr.) Tul. Glenwoodville, Alta.

Agropyron ?Smithii Rydb.

Claviceps purpurea (Fr.) Tul. Rainy River, Ont.

Agropyron repens (L.) Beauv.

Puccinia graminis Pers. South of Montreal, Que.; quite general. Widespread over Prince Edward Island. It develops earlier in season than stem rust of wheat and oats (Hurst).

Phyllachera graminis (Pers.) Fuck. Rougemont and Hemmingford, Que.

Agrostis spp.

Claviceps purpurea (Fr.) Tul.- Observed in Alberta.

Amaranthus retroflexus L.

Cystopus Bliti (Biv.) Lév. Fairly heavy infection.

Oospores plentiful in the tissues of the leaves, some mature. Saskatoon, Sask. Sept. 9, 1929. Common on the Island of Montreal, Que.

Amarella strictiflora (Rydb.) Greene (*Gentiana Amarella L. var.

Acuta (Michx.) Herder).

Puccinia Gentianae (Strauss) Link II. Fairly common in a wooded draw, Dana, Sask.

Amelanchier alnifolia Nutt.

Apicisporina Collinsii (Schw.) v. Hönnel, Manitoba

Agricultural College, Winnipeg, Man. and Redberry Lake, Sask.

Amelanchier sp.

Gymnosporangium germinale Kern. O.I. Highbury, N. S.

Quite common in an old mountain pasture. Abundance of juniper in the neighborhood.

Arabis brachycarpa (T. & G.) Britton and A. retrofracta Greene
Puccinia monoica (Peck.) Arth. C.I. This systemic rust is
common on Arabis at Saskatoon, Sask. The aecial stage appears
very early in the spring (May 5, 1929). Aecia collected May 27,
1929. (R. C. Russell).

Arctium lappa L.
Puccinia Bardanae Corda. This rust was quite common on
Oct. 5, 1929, at Kentville, N. S.

Artemisia gnaphalodes Nutt.
Puccinia Absinthii (Hedw.f.) DC. Lethbridge, Alta.
Puccinia universalis Arth. Duchess, Alta.

Artemisia sp.
Erysiphe Cichoracearum DC. St. Gregor, Sask. The fungus
apparently stimulates the host to produce fasciations.

Avena fatua L.
Puccinia graminis Pers. - P. E. I.
Puccinia coronata Cda. St. Agathe, Man., July 22, 1929.
This was the first collection of crown rust in Manitoba for the
year. Only one pustule found. Several fields of cultivated oats
were examined, but no rust was found.

Avena Hookeri Scribn.
Claviceps purpurea (Fr.) Tul. - Rosetown, Sask.
Light infection.

Aster ?Lindleyanus Torr. & Gray.
Puccinia Asterum (Schw.) Kern. Manitoba Agricultural
College, Winnipeg, Man.
Puccinia Asteris Duby - Covey Hill, Que.

Bromus Pumpellianus Scribn.
Spikelet blight caused by mites. Found at Wolf Creek,
Alta. and at several points between there and Edmonton. Affected
spikelets much enlarged.
Claviceps purpurea (Fr.) Tul. Wolf Creek, Alta.

Capsella Bursa-pastoria (L.) Medic.
Cystopus candidus (Pers.) de Bary. Common in York Co. N.B.

Chenopodium capitatum (L.) Asch.
Septoria sp. Lake Waskesin, Sask. The leaves were well
infected.

Cirsium arvense L.
Puccinia suaveolens (Pers.) Rostr. Generally distributed
in New Brunswick.

Claytonia caroliniana Michx.

Puccinia claytoniata (Schw.) Arth. Ol. - The rust was very general at Vaudreuil.

Comandra pallida DC.

Puccinia Andropogonis Schw. Stockton, Man.

Cronartium Comandrae Peck. St. Gregor, Sask. This rust is frequently found miles from the nearest pine trees.

Corylus rostrata Ait.

Gnomoniella Coryli (Batsch.) Sacc. Dana, Sask. Common.

Crataegus sp.

Gymnosporangium terminale (Schw.) Kern. Very common rust on once species of Crataegus. P.E.I.

Dactylis glomerata L.

Puccinia graminis Pers. P. E. I.

Distichlis sp.

Puccinia subnitens Diet. Vonda, Sask. Infection light.

Phyllachora graminis (Pers.) Fuck. Vonda, Sask. Infection heavy.

Dodecatheon pauciflorum (Durand) Greene.

Uromyces acuminatus Arth. Ol. Humboldt, Sask. Rather rare.

Eleagnus commutata Bernh.

Puccinia Caracis-Shepherdiae Davis Ol. Redberry Lake, Sask. Infection was quite severe. The more or less stellate arrangement of the pycnia was quite evident.

Erythronium americanum Ker.

Ustilago Heufleri Fuck. Vaudreuil, Que. Abundant in isolated patches of the host plants.

Galium boreale L.

Puccinia rupefaciens Johans. Souris, Man. Abundant.

Glycyrrhiza lepidota (Nutt.) Pursh.

Uromyces Glycyrrhizae (Rabh.) P. Magnus - Saskatoon, Sask. Infection was quite heavy.

Grindelia squarrosa (Pursh.) Dunal.

Puccinia Grindeliae Peck. Wakan, Sask. A patch by the roadside was quite heavily rusted. Not found very commonly.

Hedysarum boreale Nutt.

Uromyces Hedysarii-obscuri (DC.) Car. & Picc.

Foxwarren, Man. and Humboldt, Sask. Common.

Halerpestes Cymbalaria (Pursh.) Greene.
Puccinia Clematidis (DC.) Lagerh. OI. Redberry Lake, Sask.
Common.

Helianthus sp.
Puccinia Helianthi Schw. III. Montfort, Que. Abundant
on wild sunflowers growing in open places in the woods.

Hordeum jubatum L.
Puccinia glaucarum (Schmidt) Erikss. & Henn. Alberta.
Ustilago Lorentziana Thüm. Payton and Rosetown, Sask.
Puccinia graminis Pers. Alberta and P. E. I.
Erysiphe graminis DC. Alberta.

Iva axillaris Pursh.
Puccinia intermixta Peck. I. Milestone, Sask.

Juniperus communis L. var. hibernica Gord.
Gymnosporangium germinale (Schw.) Kern.
" clavariaeforme (Jacq.) DC.
Telia stages of both these fungi were found on the same
plant at the Experimental Station, Kentville, N. S.

Laciniaria punctata (Hook) Kuntze.
Puccinia Liatridis (Ell. & And.) Bethel. OI. Dana, Sask.
Comparatively rare.

Lactuca pulchella (Pursh.) DC.
Puccinia hemisphaerica (Pk.) Ell. & Ev. OI. and II. West
Emerson, Man.; OI, and II, III, Redberry Lake, Sask.
Puccinia patruelis Arth. OI. Redberry Lake, Sask.

Lathyrus ochroleucus Hook.
Uromyces Faba (Pers.) de Bary III, Saskatoon, Sask.
Rather heavy infection on plants growing in poplar grove.
Septoria Astragali Rob. & Desm. - leaf spot. St. Gregor,
Sask.

Leontodon sp.
Puccinia Hieracii (Schum.) Mart. II. Zealandia, Sask.
II, III. Melfort, Sask. Heavy infection.

Lygodesmia juncea (Pursh.) D. Don.
Puccinia patruelis Arth. I, Pike Lake, Sask. Medium
infection on the majority of plants in one spot.

Maianthemum sp.
Puccinia sessilis Schneid. New Minat, N. S.

Malva rotundifolia L.
Puccinia Malvacearum Bert. Kentville, N. S. Very common.

Malvastrum coccinium (Pursh.) Gray.

Puccinia Sherardiana Körn. Blackie, Alta.

Monarda menthaefolia Benth.

Puccinia Menthae Pers. III & II. Dana, Sask.

Nabulus racemosa (Michx.) DC.

Puccinia orbicula Peck. & Clint. III - Cudworth, Sask.

Persicaria Persicaria (L) Small.

Septoria Polygonorum Desm. Island of Montreal, Que.

Petasites palmata (Ait.) Gray.

Puccinia conglomerata (Strauss) Schmidt. & Kunze.

Redberry, Sask. Infection quite severe along edge of swamp.

Plantago major. L.

Erysiphe Cichoracearum DC. Common everywhere in Quebec.

Ramularia Plantaginis Ell. & Mart. Ronville Co., Quebec.

General.

Polygonum aviculare L.

Uromyces Polygoni (Pers.) Duchess, Alta.; Morris, Man.

and Henrysbury, Que.

Poa pratensis L.

Puccinia Poarum Niels. Duhamel, Alta.

Erysiphe graminis DC. Olds, Alta.

Portulaca oleracea L.

Cystopus Portulacae (DC.) Lev. Cambridge, N. S. Very common in local gardens.

Potentilla camperum Rydb. and Potentilla pulcherrima Lehm.

Phragmidium Ivesiae Syd. Beaverlodge, Alta. These two species of Potentilla were closely associated.

Potentilla monspeliensis L.

Ramularia arvensis Sacc. Hartney, Man.

Pyrola ?americana Sweet.

Helamsporopsis Pyrolae (DC.) Arth. M.A.C. Winnipeg, Man.

Raphanus Raphanistrum L.

Peronospora parasitica (Pers.) Fr. Kentville, N. S. Very prevalent at this time.

Ribes nigra.

Puccinia Pringsheimiana. Kleb. M.A.C. Winnipeg, Man.

Rosa Sp.

Phragmidium speciosum (Fr.) Cooke. Moden, Man.

Rubus spp.

Gymnoconia interstitialis (Schlect.) Lagerh. Gananoque, Ont. Very abundant in a woods.

Rudbeckia laciniata L.

Ramularia Rudbeckiae Pk. - Neepawa, Man.

Shepherdia canadensis (L.) Nutt.

Puccinia coronata Cda. Ol. Saskatoon, Sask. Quite common.

Solidago canadensis L.

Phylachora Solidaginum Sacc. Macdonald College, Que. Very abundant.

Solidago sp.

Puccinia extensicola Plowr. I. Redberry Lake, Sask. Heavy infection.

Stieronema ciliatum (L.) Raf.

Puccinia Distichlidis Ell. & Ev. M.A.C. Winnipeg, Man.

Stipa viridula Trin.

Ustilago hypodytes (Schl.) Fr. Neepawa, Man.

Puccinia substerilis Ell. & Ev. X. Raymore, Sask.

As is usual the collection shows amphispores almost to the exclusion of urediniospores or teliospores.

Symphoricarpos sp.

Septoria Symphoricarpi Ell. & Ev. St. Gregor, Sask. Fairly common.

Taraxacum officinale Weber.

Puccinia Hieracii (Schum.) Mart.- About Montreal, Que. and York Co., N. B. Infection heavy.

Ramularia Taraxaci Karst. General around Montreal, Que.

Thalictrum dasycarpum Fisch. Mey. & Ave.-Lall.

Puccinia clematidis (DC.) Lagerh. Edmonton, Alta.

Thalictrum sp.

Puccinia clematidis (DC.) Lagerh. Redberry Lake, Sask. Moderate infection.

Trifolium hybridum L.

Cercospora petriana Pass. Dauphin, Man.

Vicia sparsifolia Nutt.

Uromyces albus Diet. & Holw. O. & I. Saskatoon, Sask.

Heavy systematic infection in certain patches. The rust appears to prevent the host from flowering.

Viola pedatifida G. Don.

Puccinia Violae (Schum.) DC. O. & I. Sutherland, Sask.

The host is quite rare.

INDEX OF HOSTS

As all the diseases occurring on a given host occupy relatively few pages under the name of the hosts, it was thought unnecessary to prepare more than a host index. For diseases on miscellaneous (non-economic) plants that section should be consulted directly. The hosts are arranged alphabetically under the scientific name of the plant.

Alder	60	Egg Plant	29
Alfalfa	19	Elm	60
Apple	43		
Apricot	47	Flax	22
Artichoke	29		
Asparagus	25	Geranium	68
		Gladiolus	68
Balsam Fir.	60	Golden Glow	68
Barberry.	66	Gooseberry.	50
Barley.	15	Grape	51
Bean.	25	Grasses, Cultivated .	23
Beech	60		
Beet.	26	Hemp.	24
Begonia	66	Hollyhock	68
Blackberry.	47	Horse Chestnut. . . .	61
Buckthorn	66	Horse Radish.	29
Buckwheat	24		
Butternut	60	Iris.	69
Cabbage	27	Larkspur.	69
Caragana.	66	Lettuce	30
Carnation	66	Lilac	70
Carrot.	27		
Cauliflower	28	Mangel.	30
Cereals		Maple	61
Root rot Diseases .	7	Melon	30
Celery.	28	Mountain Ash.	61
Cherry.	48		
Cherry, Sand.	58	Narcissus	70
China Aster	66		
Chrysanthemum	67	Oats.	12
Clover, Common.	19	Onion	30
Clover, Sweet	21		
Conifers	60	Pea	31
Corn.	21	Peach	51
Cucumber.	28	Pear	52
Currant	49	Peony	70
		Phlox	70
Dahlia.	67	Pine.	61 62
Dutchman's Pipe	68	Plum.	53

Poplar	63
Potato	32
Raspberry.	55
Rhubarb.	36
Rose	71
Rye.	18
Salsify.	37
Snapdragon	71
Soybean.	24
Spinach.	37
Spruce	65
Strawberry	58
Sugar Beet	37

Sunflower	22
Sweet Pea	71
Tobacco	38
Tomato.	39
Tulip	72
Turnip.	41
Vetch	24
Walnut, English	65
Watermelon.	42
Wheat	1
Willow.	65
Zinnia.	72

DOMINION OF CANADA
DEPARTMENT OF AGRICULTURE
EXPERIMENTAL FARMS BRANCH



H. T. GUSSOW,
Dominion Botanist.

E. S. ARCHIBALD,
Director.

TENTH ANNUAL
REPORT
ON THE
PREVALENCE OF PLANT DISEASES
IN THE
DOMINION OF CANADA
1930

. o o

COMPILED BY:

I. L. CONNERS,
Plant Pathologist,

E. A. EARDLEY,
Plant Disease Investigator.

FOREWORD

The tenth annual report on the prevalence of plant diseases in Canada differs little in appearance from previous reports, but I believe its worth and usefulness has been greatly increased. Our collaborators responded wholeheartedly to the request that they forward their observations by November 15. The early receipt of their material has permitted me to issue the report for 1930 at this time, before field observations for the current year have begun. There has also been a marked increase in the data presented. Not only a large number of isolated observations were reported, but for many of the more important diseases the observations were often summarized by the collaborator before they were submitted to me. These summaries have greatly reduced the labour of compilation, and they crystalize many observations of the man in his own territory, which otherwise would be unrecorded.

As in previous years, I have compiled this report almost entirely from the records presented by our collaborators, whom I sincerely thank for their co-operation. The thorough-going summaries prepared by Drs. A. W. Henry, G. B. Sanford and P. M. Simmonds and their assistants for Alberta and Saskatchewan were particularly valuable. I am again indebted to Mr. R. C. Russell and other of the Dominion Laboratory of Plant Pathology at Saskatoon for their records of parasitic fungi on many native hosts.

An innovation has also been made in reporting the distribution of plant diseases in the Prairie Provinces. Where the disease was known to be widely distributed over the Province its distribution was often indicated in terms of the province as a whole. Where a disease was of less common occurrence it was customary to give the town or towns near where collections had been made. It was evident that a geographical unit between these extremes would be useful. However, as the political divisions were unsuitable, it was decided for the plant disease survey to divide the provinces into zones based primarily on soil type. Differences due to elevation and geographical position were also taken into account in dividing up some of the areas that are essentially of one soil type. These zones have been named and notes on the nature of the soil, etc., has been kindly supplied by the Soils Departments of the Provincial Universities. This information is given below. Outline maps showing the Plant Disease Survey Zones were printed on the back of the plant disease summary cards, which are in use in these provinces. These maps are reproduced in fig. 1, p.2 (Manitoba); fig. 2, p.6 (Alberta) and fig. 3, p.26 (Saskatchewan). In the map of Saskatchewan the divisions used by the Provincial Department of Agriculture are also shown, while in Alberta the major soil zones are indicated.

I have been assisted in the preparation of this report by
Mr. H. A. Eardley.

March 1931,
Division of Botany,
Ottawa, Canada.

I. L. Connors,
Plant Pathologist.

PLANT DISEASE SURVEY ZONES

MANITOBA

1. Red River Valley:- Heavy clay with high organic content, high lime, heavy textures prevailing, moist, frequently poorly drained.. Wheat.
2. Carberry-Morden:- Sand and silt loam, with moderately low organic content, calcareous, relatively high texture, generally well drained, inclined to drought in dry seasons. Sand dunes in central portion. Wheat.
3. Brandon-Boissevain:- Undulating till loam plain, sandy with moderate organic content, calcareous, surface soil more or less eroded in higher positions, frequently saline in low positions, cooler than (1) and (2) owing to altitude. Wheat.
4. Deloraine:- Mixed to short grass prairie plain, sandy with moderate organic content, calcareous, lighter texture than (3), well drained, subject to periodic droughts, lower than (3). Wheat.
5. Roblin-Minnedosa:- Undulating boulder till, formerly prairie undergoing tree invasion; sandy with moderate organic content (except islands of old woodland); low positions frequently saline; islands of old woodland, acid; sloping westward, moderately cool. Oats.
6. Virden-McCauley:- Delta sand area containing sand dunes, low organic content, high lime inclined to drought.
7. Grandview-Neepawa:- Bench land at foot of Riding Mountain, receiving constant additions of eroded material from the mountains; soil varied with high organic content; high lime, moderately deep heavy loam frequent, well drained, lower than land to west, and warmer than (5). Wheat.
8. Swan River Valley:- Valley plain moderately high organic content, formerly wooded, soil variable in texture, moderately moist, low altitude, warmer than (5). Wheat.
9. Unclassified Area:- Poorly drained plain containing a variety of soils-rendzina, salines, peat with wooded lands, rock out-crops, and some lakes. In general not suited to agriculture.
10. Porcupine Mountain:- Same as (10) for Saskatchewan.

SASKATCHEWAN

1. Indian Head-Alameda:- Average loam, organic matter high, lime high, moisture good. Wheat and other cereals.
2. Moose Jaw-Estevan:- In general a heavy clay loam, organic matter moderate, limy, moisture low. Wheat and other cereals.
3. Swift Current:- Much heavy soil and some sandy soil, organic matter low, limy, moisture low. Wheat and other cereals.
4. Govenlock:- Light soils, organic matter low, lime high, moisture low. Rye and corn, etc.
5. Cypress Hills:- Loam soil, organic matter high, limy, moisture good. Rye and corn, etc.
6. Leader-Maple Creek:- Same as (4).
7. Humbolt-Yorkton:- Average loam, organic matter high, lime high, moisture good, increasing towards north. Wheat and other cereals.
8. Swan River Valley:- Same as (8) for Manitoba.
9. Biggar-Saskatoon:- Intermediate loams, organic matter moderate, limy, moisture moderate. Wheat and other cereals.
10. Ste Brieux-Hyas:- Loam soil, organic matter low, lime not high, moisture good. Oats and other cereals.
11. Battleford-Prince Albert:- Loam to silty clay loam, organic matter high, limy, moisture good. Oats and other cereals.
12. Canwood-Cumberland House:- Same as (10).
13. St. Walburg-Big River:- Same as (10).

ALBERTA

1. Medicine Hat-Prairie:- Scanty rainfall. Elevation 2400-3000 ft. Open territory.
2. Lethbridge-Cardston:- Soil variable. Heavy dark brown silty loam in eastern and northern sections to loam with higher organic content in the Cardston-Pincher Creek strip. Rainfall fair in east to good in the west. Elevation 3000-3700 ft., westward. Open territory.

3. Gleichen-Kobleford:- Dark brown silt to sandy loam. Rainfall better than (1), often light, Elevation 3000-3400 ft. Open territory.
4. Claresholm-High River:- Darker brown than in zone 3. Fairly high in organic content. Rainfall usually fair to good. Elevation 3400 to about 3500 ft. Average about 3500 ft. Open territory.
5. Empress-Hanna:- Variable, sandy to light loam. Rainfall usually light, Elevation 2200 ft. in the south to 2500 ft. in the north. Open territory.
6. Drumheller-Calgary:- Variable from silt to dark sandy loam with fair organic content in local areas. Large clay soil district adjacent to Drumheller. Rainfall annual average about 15 ins. Elevation varies from 2700 ft. in the east to about 3400 ft. at Calgary. Average elevation about 3000 ft. Open territory.
7. Foot-Hills:- Drift material, sand, silt and clay. Elevation 3000 ft. Wooded.
8. Castor-Wainwright:- Brown sandy soil predominating. Sandy areas common. Rainfall less than in zone 6, but more than in zone 5. Elevation 2200 ft. in the north to 2700 ft. in the south. Park and open territory.
9. Lloydminster-Vegreville:- Soil with fairly high organic content predominating. Rainfall average slightly more than in (5), but usually less than in (10). Elevation about 2000 ft. Parkland.
10. Olds-Red Deer-Camrose-Edmonton:- Generally high organic content. Rainfall annual average approximately 17 ins. Elevation varies from 3400 at Olds to 2400 at Camrose and 2200 ft. at Edmonton. Typical parkland.
11. Stony Plain-Edson:- Drift material with frequent patches of dark brown to black soil in local areas. Rainfall similar to that in (10). Elevation 2300 at Stony Plain and 3000 ft. at Edson. General poplar bush.
12. Athabasca:- Drift material with small local areas of darker soil with more organic content. Rainfall usually less than in (10). Elevation about 1700 ft.
13. Grande Prairie-Peace River:- Large local areas contiguous to Peace River and Grande Prairie with good agricultural soil, fairly high organic content. Adjoining areas mostly characteristically wooded soils. Rainfall less than in (10), average about 16 ins. Elevation 2300 ft.

DISEASES OF CEREAL CROPS

WHEAT

STEM RUST - Puccinia graminis Pers.

B.C.--

Only a slight amount of stem rust was present on Vancouver island and in the lower Fraser valley.

Alta.--

Stem rust was first collected on August 31, just as the crop was mature (G. B. Sanford). Afterwards some of the late crop in Plant Disease Survey zone 9 was found slightly rusted. Late volunteer plants in southern Alberta were similarly affected. Stem rust was observed in 24 fields out of 702 examined, being present in zones 2,4 and 8-10. It caused no appreciable damage. (For an explanation of the Plant Disease Survey Zones established for the 3 Prairie Provinces see the Foreword).

Sask.--

The first collection of stem rust was made at Indian Head on July 11, when a single infected plant was found. By July 15 rust could be found as far north as Wadena and on July 26, it was reported from Pontrillas, 60 miles north of Saskatoon.

In Saskatchewan the rust situation was similar to that in Manitoba. Rust infection in the drier areas was very light, while in the heavier crop regions stem rust was abundant. Infections from 50 to 80 per cent were reported on common wheat throughout the area from Indian Head to the Manitoba boundary; 50 to 100 per cent from the Manitoba boundary to Melville, where the crops were, in general, late; and 25 to 50 per cent from Melville west to Qu'Appelle. From Loosomin southward rust infections became progressively lighter, ranging from 20 to 40 per cent about Carnduff and Estevan. Westward towards Weyburn infections became still lighter; in this district the rate of infection was less than 20 per cent. Only traces of rust were found in the Saskatoon area and infections were light throughout western Saskatchewan. No estimate of the damage caused by rust was made.

On durum wheat infections ranged from a trace to 15 per cent.

Man.--

Stem rust was quite prevalent on common wheat throughout the whole of Manitoba and was fairly heavy in all sections of the province except the south west corner, which suffered from lack of precipitation. The drought had served to check the progress of the rust to such an extent that losses in that area were estimated to be not more than 3 per cent. In all districts of the province outside the dry

Wheat

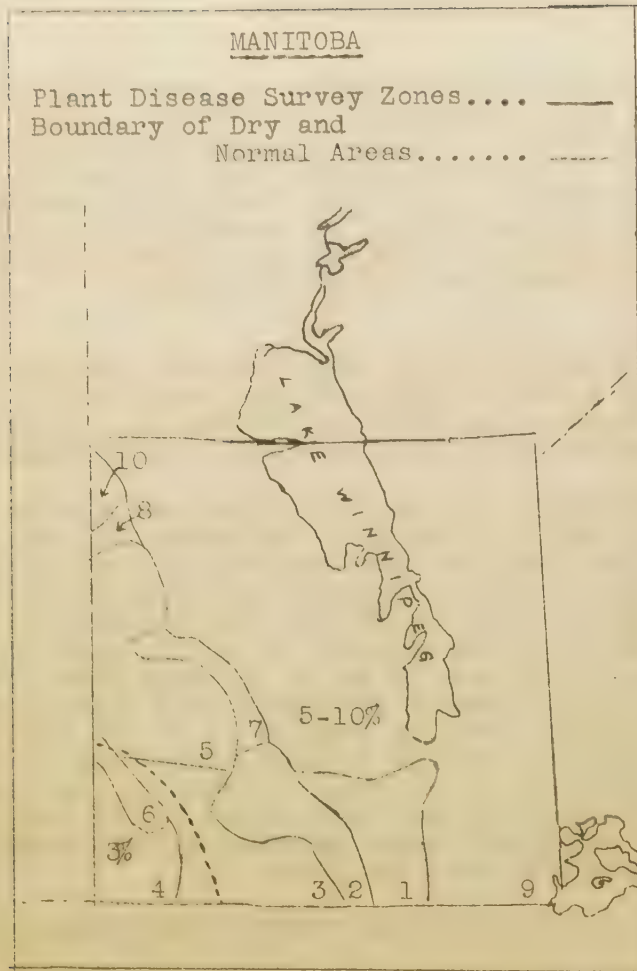


Fig. 1 Prevalence of stem rust in Manitoba in 1930.

area, stem rust losses were estimated to be 5 to 10 per cent of the crop. The severity of the rust in particular fields varied widely with the rankness of growth and the lateness of maturity. Early thin stands were only slightly affected while in fields, where the crop was heavy and late, it was invariably heavily infected and severely damaged by rust, both the grade and yield of grain being lowered. (See Fig. 1).

Weather conditions were favourable for the development and spread of stem rust, from the time of its appearance in June until the latter part of July. A period of hot, dry weather, which began then and extended into August, greatly hastened the maturity of the crop and to some extent retarded the further advance of stem rust. The rust, however, had become too firmly established to be materially checked by a few days of adverse weather conditions.

Stem rust was first observed on wheat on June 26, at Winkler, where several culms were found affected, each bearing a single pustule. A careful survey of the Red River valley at that time failed to reveal additional infections. Traces of stem rust were found on July 3-5 throughout the southern part of Manitoba as far west as Regent. Secondary infections of stem rust were present on July 8 in the Red River valley. Traces of rust were found north of Portage la Prairie on July 10, and as far north as Roblin on July 17. Stem rust became steadily more prevalent, first in the Red River valley, and then throughout the province reaching the proportions indicated in the first paragraph.

Only slight traces of stem rust developed on durum wheat; the infection was not sufficiently heavy to cause measurable damage.

Ont. -

Stem rust was fairly light in southern Ontario. It was also light in the Experimental plots at Ottawa, the infection being about 10 per cent.

Que.-

In Kamouraska and l'Islet counties stem rust infections were about 10 per cent on Marquis and 10 to 20 per cent on Huron.

P. E. I.-

Only traces of stem rust were present on the early maturing crops, while it was abundant, causing appreciable damage, in late fields of wheat.

LEAF RUST - Puccinia triticina Erikss.

B.C.-

Slight infections of leaf rust were observed on Vancouver

Wheat

island and in the lower Fraser valley.

Alta.-

Secondary infections of leaf rust were found on winter wheat at Claresholm as early as April 10, by Dr. Sanford. In these fields he believed that the rust had overwintered.

Only traces of leaf rust were found in 14 fields out of 702 examined in August. The fields were located in zones 2-4, 9 and 10.

Sask.-

Only a slight infection of leaf rust was reported. The first recorded infection was observed on June 25 at Saskatoon. Leaf rust had begun to spread by this date in south-eastern Saskatchewan.

Man.-

Leaf rust was first collected at Treeshank. Primary infections occurred early and by July 8 the rust was fairly prevalent on common wheat throughout southern Manitoba. It became very abundant in central and southern Manitoba at the close of the growing period, the degree of infection ranging as high as 90 per cent, with 100 per cent of the plants infected. The losses from leaf rust are included in the estimated losses from stem rust. Durum wheat was only slightly infected.

Ont.-

Leaf rust was present in rather limited quantities in southern Ontario. On the other hand it was prevalent in Carleton county. An average infection of 40 per cent was common on Marquis and Huron, by July 15. At Comptreile, in Grenville county, 60 to 100 per cent of the leaf surface of Clarkov, a winter variety, was rusted by July 5.

P.E.I.-

Leaf rust was abundant on Huron, causing some premature withering of the leaves.

STRIPE RUST - Puccinia glumarum (Schm.) Erikss. & Henn.

Alta.-

Stripe rust was found on wheat in southern Alberta only, in 16 fields out of 711 inspected. Fairly heavy leaf infections were noted in several fields of Red Bobs and Kitchener. It was also collected on Marquis. Stripe rust was found in both southern and central Alberta on Tordeum jubatum, being observed in 46 locations out of 96 inspected. The rust was more abundant in southern Alberta, appearing first in June, but it was also present in central Alberta by September. No collections were made on Agropyron tenerum, A. Smithii and A. dasystachyum. Stripe rust was also collected at Windermere, E. C.

BUNT - Tilletia Caries (DC.) Tul. and
Tilletia foetens (Berk.) Trel.

Before summarizing the results of field surveys in B. C., Alta., and Sask., data obtained from the records of Western Grain Inspection Division covering western Canada for the three months ending Oct. 31, 1930 are given. The records show that the following percentages of cars graded "Smutty":-

Hard Red Spring	1.7 per cent
Alberta Red Winter	5.5 " "
Durum	16.6 " "
All wheat	2.8 " "

Compared with 1929 there was a marked increase in losses from bunt especially in Hard Red Spring wheat.

B.C.--

There were fairly heavy losses from bunt in winter wheat on Vancouver island and in the lower Fraser valley. Both species of Tilletia were present, T. Caries predominating.

Alta.--

Bunt was unusually common this year and appeared to be more prevalent than in 1929 according to Dr. Henry. It was reported in zones 2-4, 6 and 8-10, in 36 out of 286 fields inspected. The damage was estimated at 1.4 per cent. An examination of the spores showed that both species of Tilletia were equally prevalent and were present in the same territory. (See Fig. 2). The relative prevalence of the species by zones was as follows:

Tilletia Caries, 5 collections in zones 2-4 and 14 in zones 8-10;
Tilletia foetens, 9 collections in zones 2-4 and 6 in zones 8-10.

Dr. Sanford did not report as heavy losses as given above, but he noted that some elevators had reported a considerable number of cars grading "Smutty".

Sask.--

Bunt was found in 10 fields out of 200 examined. The damage was estimated at one per cent.

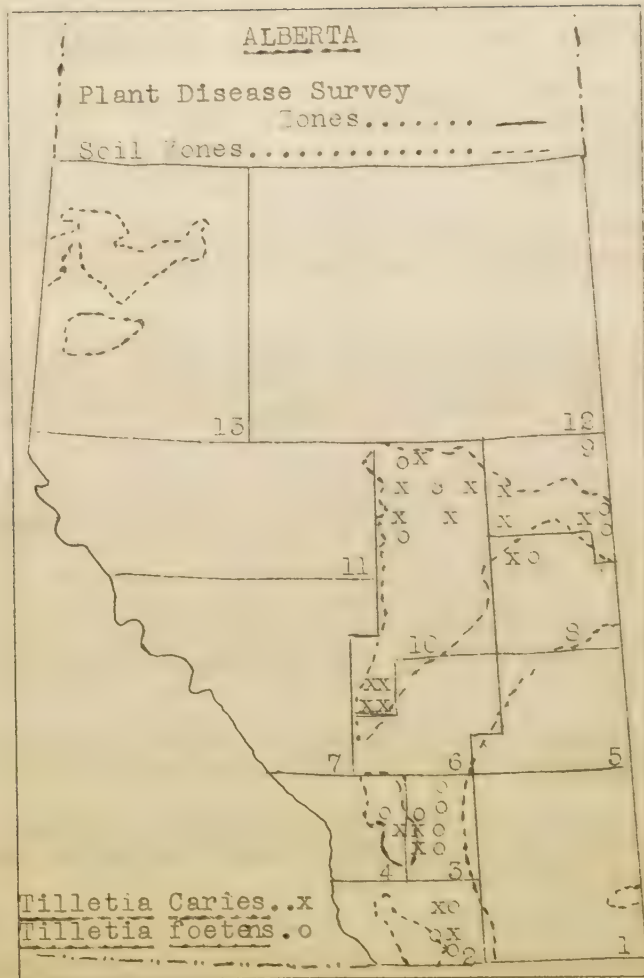
Que.--

Bunt was found in 4 fields out of about 20 examined in Kamouraska and l'Islet counties. Infections ranged from 2 to 5 per cent in the affected fields.

N.B.--

A single specimen of Tilletia Caries was collected in York county.

Wheat



LOOSE SMUT - *Ustilago tritici* (Pers.) Pers.

B.C.-

Slight infections of loose smut were found on Vancouver island and the lower Fraser valley.

Alta.-

Loose smut was comparatively rare this year. Traces were found in 11 fields out of 702 examined. The heavy infection in Reward wheat in 1928 has tended to disappear in the last two years. By actual count the highest infection observed in this variety was 3/10 of one per cent according to Dr. Sanford.

Sask.-

Out of about 360 fields examined, 42 showed traces of loose smut, while in 9, infections ranged from 1 to 5 per cent.

Man.-

Loose smut was found in 38 out of 115 fields, causing an estimated average loss of 3.6 per cent. This figure may be somewhat too high as Reward wheat was more severely affected than other varieties, while the acreage devoted to this variety was comparatively small.

Ont.-

In southern Ontario loose smut was very heavy on Dawson's Golden Chaff and Imperial Amber. It apparently is becoming more serious. In Carleton county loose smut was comparatively heavy. Infections ranged from a trace to 7 per cent, being particularly heavy on Huron. Practically every field showed at least a trace.

Que.-

Loose smut was observed in Kamouraska and L'Islet counties, infections varying as follows: Marquis 2-5 per cent; Huron 3-10 per cent. Out of 20 fields of Huron examined none were free from smut.

BLACK CHAFF - *Pseudomonas translucens* J.J. & R.
var. undulosa J.J. & R.

Alta.-

Only one definite case of black chaff was observed. A discoloration of Reward wheat, which superficially resembles black chaff, is apparently not caused by the black chaff organism (G. B. Sanford). (See 1929 Report p. 7).

Sask.-

Black chaff was observed in the University plots, Saskatoon, especially on hybrid plants. The disease was patchy and light,

Wheat

causing practically no damage.

Man.-

Black chaff was not common this year; a trace was found in several fields. In a field near Morden, however, 90 per cent of the plants were severely infected.

BASAL GLUME ROT - Pseudomonas atrofaciens (McCull.) Stev.

Alta.-

Basal glume rot was present in 20 fields out of 702 examined. In most fields, only a trace of infection was recorded, but in 2 fields 50 per cent of the plants were affected.

Sask.-

The disease was found in only 3 fields, the damage being merely a trace in every case.

Man.-

Traces of basal glume rot were found in 9 fields in zone 1.

P.E.I.-

Glume blotch was observed, causing 10 to 25 per cent infection on Red Pile and Huron respectively. The damage was moderate. (This report should be under Glume Blotch, page 12.)

ERGOT - Claviceps purpurea (Fr.) Tul.

B.C.-

A very slight amount of ergot occurred on Vancouver island and in the lower Fraser valley.

Sask.-

Traces were found on wheat in several parts of the province, but it was relatively rare and of little economic importance this year.

N.B.-

A single infected plant was found in York county.

P.E.I.-

A trace was observed on Huron wheat.

POWDERY MILDEW - Erysiphe graminis DC.

B.C.-

Heavy infections on wheat occurred at the Experimental

Farm, Saanichton. The damage was nil.

Alta.-

Dr. Sanford reported that a trace of powdery mildew could always be found if a careful examination was made. Sometimes the infection was heavy, but no damage from the disease could be detected. Powdery mildew was reported less frequently by Dr. Henry; he also found it causing no damage.

Sask.-

A fairly heavy infection of powdery mildew was reported on the lower leaves of winter wheat in the University plots, Saskatoon. The damage was probably slight. It was also severe on several plots of spring wheat.

Ont.-

The lower leaves on several varieties were heavily infected in the Experimental Farm plots, Ottawa. A medium infection of the lower leaves of Sharkey, a winter wheat was noted at Kemptville.

P.E.I.-

A trace was observed at the Experimental Station, Charlottetown.

FOOT AND ROOT ROT

The foot and root rot diseases of wheat are considered together as the records that were submitted frequently discussed all these diseases as a unit, with special reference here and there to specific pathogens.

B.C.-

Take-all (Ophiobolus graminis Sacc.) was serious in a number of districts.

Foot rot (Helminthosporium sativum P.K. & B.) caused considerable damage in certain districts.

Alta.-

As in 1929, damage from foot and root rots was difficult to determine in certain areas, where precipitation was light during May, June and early July. The zones where root rot damage was obscured by dry soil conditions were 1, 5, 6, 8 and 10.

Take-all (Ophiobolus graminis) was more abundant and more widely distributed than in 1929. It was particularly prevalent in the black soils of zones 9 and 10, although it was present in the adjacent zones and in southern Alberta. It was reported in 60 fields out of 236 examined (A. J. Henry).

Wheat

The total damage from take-all was decidedly greater in 1929, particularly in zones 2, 4, 9 and the eastern portion of 11 (G. B. Sanford).

Regarding the root rotting organisms Dr. Sanford said "As usual Helminthosporium sativum, Fusarium spp., Wojnowicia graminis (McAlp.) Sacc. & D. Sacc. and Leptosphaeria herpotrichoides de Not. were general over Alberta." Combining the root rot caused by Ophiobolus graminis and Helminthosporium sativum he found 277 fields diseased out of 416. The estimated average damage for all fields was 2 per cent. In fields, where the disease was more than a trace, the average damage was placed at 5.8 per cent. Zones 12 and 13 were not surveyed. Leptosphaeria herpotrichoides was definitely identified in 5 collections of root rot.

Foot rot in Alberta, aside from take-all, appeared to be primarily caused by Helminthosporium sativum and Fusarium spp. according to Dr. Henry, although Leptosphaeria herpotrichoides and Wojnowicia graminis were also present. He reported foot rot in 163 fields out of 286 examined. It was most prevalent in zones 2-4 and 10. The estimated average damage for all fields was 0.27 per cent.

Sask.-

Take-all (Ophiobolus graminis) was found in 87 fields out of 483 examined. The severity of infection was estimated as follows: a trace (less than one per cent), 65 fields; light (1-5 per cent), 14; moderate (6-20 per cent), 5; and severe (over 20 per cent), 3. In a field in southern Saskatchewan 48 per cent of the plants showed lesions and Ophiobolus mycelium in June. No estimate of damage was made.

Take-all appeared on Kharkov wheat in the University plots, Saskatoon. Take-all patches were scattered through the plots, but caused little damage. Plates of typical Ophiobolus mycelium were present inside the sheaths of the lower leaves, but no perithecia were observed. Instead, mature pycnidia of Wojnowicia graminis were abundant on the take-all plants.

Prematurity blight was found in 9 fields out of 219 examined; only traces were present in the diseased fields.

Browning root rot was reported by Dr. Simmonds, from 144 fields out of 483 examined. The severity of infection was as follows: a trace in 58 fields; light in 19, moderate in 38, and severe in 29.

Browning root rot caused by Pythium spp. etc. was not as severe on spring wheat over the province as a whole as in the wetter season of 1928. It probably was least common and of little

economic importance in the south-west part of Saskatchewan. It appeared to be confined to the crop on summer-fallow. Frequently seventy-five per cent of the plants were attacked causing medium to heavy damage. In severe cases a loss of 10 to 15 bushels per acre is common. Many farmers have reported a lower yield of wheat on summer-fallow than on stubble. The disease is first noticed on the plants when they have reached a height of 4 to 8 inches. The seasonal distribution depends on rainfall and temperature (T. C. Vanterpool).

Browning root rot was also found on Kharkov (winter wheat) on the University plots, Saskatoon. In a "date of seeding" experiment, plants from all "dates of seeding" had as many as one third of their root tips necrotic and packed with Pythium oospores. It was difficult to estimate the damage. This is probably the first report of Pythium on winter wheat in Saskatchewan (T. C. Vanterpool).

Helminthosporium-Fusarium root rot caused by Helminthosporium sativum and Fusarium spp. was found in 440 fields out of 483 examined. The severity of infection was as follows: a trace in 36 fields, light in 32, moderate in 140 and severe in 232. The damage is exceedingly difficult to estimate.

Man.--

Traces of take-all (Ophiobolus graminis) were found in one field in each of the zones 1, 2 and 4.

Root rot caused by Helminthosporium sativum and Fusarium spp. was found in 79 fields out of 124 examined. The average percentage of plants infected by zones were as follows: zone 1, 4 per cent; zone 2, a trace; zone 3, 3 per cent; zone 4, 20 per cent; zone 5, 2 per cent; zone 8, a trace, zone 9, 15 per cent. Although it is difficult to estimate the damage caused by root rot, losses were undoubtedly heavy in zone 4.

HEAD BLIGHT - Gibberella Saubinetii (Mont.) Sacc. & Fusarium spp.

Alta.--

A single blighted head was found at New Norway by Dr. Henry in August. Material bearing perithecia of Gibberella Saubinetii was collected at Claresholm in April by Dr. Sanford. The fungus was isolated in pure culture from the perithecia.

Man.--

Traces only of head blight were found in zones 1 and 2.

N.B.--

A trace of head blight was found on Garnet wheat in the row plots at the Experimental Station, Fredericton.

Wheat

P.E.I.-

Infections varying from a trace to 100 per cent were observed on Huron and Red Fife in Kent and Prince counties. Appreciable losses from this disease occur each year (R.R. Hurst).

HEAD BLIGHT - Helminthosporium sativum P.K. & B.

Head blight, caused by Helminthosporium sativum, was reported on wheat from Edmonton, Alta. It also caused some spotting of the leaves.

GLUME BLOTCH - Septoria nodorum Berk.

B.C.-

Slight infections of glume blotch were observed.

Alta.

Glume blotch was found in only 16 fields out of 702 examined, wheat being remarkably free from this disease in 1930. Infection rarely exceeded a trace.

Sask.-

Glume blotch was found in only 3 fields. Infection was a trace in each case.

LEAF SPOTS - Cause undetermined.

Alta.-

Wheat affected with leaf spots were reported by Dr. Sanford in 11 fields out of 415 examined. The foliage was remarkably free from leaf spots.

Sask.-

Leaf spots were very prevalent and difficult to identify. Some of the spotting was due to Septoria spp. or bacteria, but in many instances the cause was unknown. Leaf spots were reported in 174 out of about 300 fields examined. The severity of infection was as follows: Trace in 59 fields, light in 8, moderate in 30; and severe in 77.

NEMATODE DISEASE - Heterodera punctata Thorne

This disease was reported twice in Sask. "This nema appears to come from the native sod when it is broken up; it is apparently parasitic and easily destroyed by crop rotation."

(R.C. Russell).

OATS

STEM RUST - Puccinia graminis Pers.

Alta.-

Stem rust was exceedingly rare being found in zones 3 and 10 in 3 fields out of 202 examined;

Sask.-

Oats were only slightly rusted in east central Saskatchewan.

Man.-

Stem rust of oats was heavy on late oats in the Red River valley, causing noticeable damage; early oats however yielded well. The average damage was placed at 5 per cent. The average percentage of infection by zone was as follows: 40 per cent in zone 1, and southern part of 9; 20 per cent in 2; 15 per cent in 3; 10 per cent in 5 and 8; and 5 per cent in 4 and 6.

Ont.-

Early varieties escaped heavy infection in southern Ontario. Late varieties, however, were heavily infected resulting in considerable damage.

Que.-

Infection on oats varied from 3 to 10 per cent in Kamouraska and l'Islet counties.

N.B.-

Stem rust was practically absent from the Experimental Station plots, Fredericton. Infection was only a trace.

N.S.-

Only traces of stem rust were observed in a field in Halifax county.

P.E.I.-

Stem rust was absent from the early maturing crop, but it was severe and caused serious damage to late fields.

LEAF RUST - Puccinia coronata Corda

B.C.-

Traces of leaf rust only were found on Vancouver island.

Alta.-

No leaf rust was observed in Alberta.

Sask.-

Traces of leaf rust were reported from Saskatchewan.

Oats

Man.-

Buckthorn bushes were found rusted at Boissevain, Man., only. In the vicinity of these bushes leaf rust was found on oats about July 8, before its appearance elsewhere. Eventually, leaf rust was general throughout the Red River valley; infections, however, were light, averaging about 5 per cent. The damage was very slight. Rust was scarce in the western half of the province.

Ont.-

Early varieties mostly escaped infection, but all late varieties were heavily rusted in southern Ontario.

Leaf rust was absent or traces only were present in Carleton county, except in fields near cultivated or escaped buckthorns.

The importance of the buckthorn in initiating epidemics of leaf rust was well illustrated at Antrim, in Carleton county. Two buckthorn hedges about 125 feet long were found bordering the north and south sides respectively of the front lawn of a farm house. These bushes were about 8 feet high although they were kept well trimmed. The owner reported that they were about 50 years old. This was the only cultivated hedge that was located, but numerous escaped bushes were found within a radius varying from a half to one and one half miles from the hedges. All the escaped bushes were located along the fence rows, none were found in the open in the pastures. The bushes were of all ages and heights, varying from young plants 2 feet high to mature ones 8 to 10 feet in height. In several instances the buckthorns were growing intermixed with chokecherry and plum forming almost continuous hedges. The older bushes were actively reproducing themselves except the two hedges which in recent years have been kept trimmed to prevent the setting of seed.

Leaf rust on oats was heavy around the edges of the fields, where buckthorns were growing. Near the buckthorns the crop was often lodged and infected 100 per cent with rust. On the upright plants infection was somewhat less, 60 to 100 per cent of the leaf surface being rusted. From the edge of the field the rust gradually became lighter until at 75 yards, only 25 per cent of the plants were rusted, the affected plants showing a trace to 5 per cent infection. At this point infection became almost stationary. In adjacent fields, without buckthorns along the edges infection often fell to a trace or not over 25 per cent of the plants. Several fields between Antrim and Ottawa were examined the same day for leaf rust. Sometimes no rust was observed and generally less than one per cent of the plants were infected with traces of rust.

Damage caused by leaf rust was not great except close to the buckthorns and might be considered of little importance, but it

should be noted that the present season was not particularly favourable for the development of rust and under conditions ideal for rust development the yield would be seriously reduced.

It might be mentioned that the presence of buckthorn in the Antrim district was discovered by first finding rust on the oats and then noting its severity while walking through the field.

The observations made this year were limited, but they strongly suggest that the buckthorn is entirely responsible for the occurrence of leaf rust and the losses occasioned thereby in eastern Ontario.

N.B.-

Leaf rust was widespread, but caused only moderate damage this season.

N.S.-

Leaf rust caused only slight damage. In several fields no rust was found.

P.E.I.-

Leaf rust was heavy, apparently causing severe injury.

SMUTS

Covered Smut - Ustilago levis (Kellerm. & Swingle) Wagn. and
Loose Smut - Ustilago Avenae (Pers.) Jens.

B.C.-

Loose smut was general on Vancouver island and in the lower Fraser valley. The damage, however, was slight.

Alta.-

Covered smut is a common and destructive disease in Alberta. It was reported in 15 fields out of 47 examined by Dr. Henry. In one field 35 per cent of heads were destroyed. Without distinguishing the species responsible, Dr. Sanford reported smut infection in 29 out of 155 fields examined. He also collected covered smut on wild oats, Avena fatua, at Granum and Edmonton and on a fatuoid form of Victory at Olds. In some places this smut was rare and its absence was apparently due to proper seed treatment.

Sask.-

Covered smut was reported in 39 fields out of 129 inspected. Infections as high as 10 per cent were observed in several fields. Loose smut was found in 6 fields out of 127 examined.

Man.-

Covered smut appears to be much more prevalent than loose

Oats

smut. It was present in 55 out of 57 fields widely scattered over the province. The estimated average infection was 6.4 per cent.

Loose smut was found in 35 fields out of 45 examined; the average infection was estimated to be 0.5 per cent.

Ont.-

Covered smut was reported on Alaska, O.A.C. 3, Banner, Gold Rain, Abundance, and Victory in southern Ontario. O.A.C. 3, and O.A.C. 72, were very susceptible. Covered smut was present in practically every field examined in Carleton county. The average infection in 11 affected fields was 6.3 per cent; 15 per cent of the heads were affected in 2 fields.

Loose smut was found in Banner, Alaska, O.A.C. 72, Gold Rain, Abundance, O.A.C. 13 and Victory in southern Ontario, Banner was particularly heavily attacked, infections as high as 20 per cent were observed in some fields. O.A.C. 144, Markton and Burt were resistant.

Loose smut was generally less prevalent than covered smut in Carleton county although in one field 22 per cent of the heads were destroyed.

Que.-

In Kamouraska and l'Islet counties loose smut infections varied from 1 to 5 per cent in Banner and 3 to 5 per cent in Alaska. No covered smut was reported.

N.B.-

Covered smut was widespread in York county. In several plots of Victory at the Experimental Station, Fredericton, the average infection was estimated to be 7 per cent.

Seventeen per cent of the heads were destroyed by loose smut in a field of Victory at the Experimental Station, Fredericton. The disease was widespread in York county.

N.S.-

Observations on the oat smuts were made in Halifax and Colchester counties. Infections of covered smut varied from 10 to 20 per cent and those of loose smut from 5 to 20 per cent. In fields, where the infection was high, the seed had not been treated; fields sown with treated seed were free from smut.

HALO BLIGHT - Pseudomonas coronofaciens (Ch. Elliott) Stev.

B.C.--

Halo blight was general on Vancouver island and the lower mainland.

Alta.--

Halo blight was reported by Dr. Henry in 4 fields out of 47 examined, being quite prevalent in zone 10. Dr. Sanford reported that halo blight was apparently common wherever Victory oats were grown. He found halo blight in 35 fields, out of 155 examined, infections ranging from a trace to general.

Sask.--

Halo blight was severe in a field of oats at Armley. The field appeared quite brown from the roadway. The observations were made following a fortnight of rainy weather.

Man.--

Halo blight was observed in one field located in zone 4. One hundred per cent of the plants were severely diseased.

Ont.--

What appeared to be halo blight, affected several varieties, especially Banner, on the Experimental Farm, Ottawa. The infection however, was very uneven, some plots were severely affected while others of the same variety from the same seed lot were free from disease. The location of the plot in the field and the date of seeding seemed to determine the severity of infection. Halo blight was also observed in two fields in Carleton county. About 40 per cent of leaf surface was affected.

N.B.--

A slight infection of halo blight was observed on Victory at the Experimental Station, Fredericton.

FOOT AND ROOT ROT

Sask.--

Prematurity blight was much less common than it has been for some years. One field out of 60 examined was affected and in this field the damage was a trace.

Browning root rot (Pythium sp.) was observed in 2 fields out of 127 examined. The disease was relatively rare in oats this year.

Helminthosporium-Fusarium root rot was present in 81 out of 127 fields, being about as prevalent as last year.

Oats

Man.--

Root rot of oats caused by Helminthosporium sativum and Fusarium spp. was uncommon. It was reported from 3 places, a light infection in 2 and 40 per cent of the plants affected in the third.

BLAST - Non-parasitic.

Alta.--

Oat blast was observed in zones 2-5, 7 and 10, the average percentage of blasted spikelets varying from 2.3 to 12.0 per cent according to the zone. These figures are based on counts of blasted spikelets of representative plants in the field. Out of 155 fields examined 61 were affected. If the blasting of the spikelets reduces the yields, the trouble was sufficiently heavy this year to cause much loss (G. B. Sanford).

Out of 47 fields examined by Dr. Henry, 5 were found affected. The estimated loss was a trace.

Sask.--

Oat blast was reported in 25 out of 127 fields. The estimated average damage was 5 per cent.

N.B.--

Oat blast was widespread and fairly severe on oats. Ninety per cent of the plants were moderately affected in several varieties at the Experimental Station, Fredericton.

P.E.I.--

About 10 per cent of the heads were severely affected in several fields of Banner.

LEAF SPOT - Helminthosporium Avenae Eidam

B.C.--

The disease was general on Vancouver island and the lower Fraser valley. The damage was slight.

N.B.--

A leaf spot attributed to Helminthosporium Avenae was severe on several varieties at the Experimental Station, Fredericton. The disease was widespread.

FALSE STRIPE - Cause unknown.

A disease similar in appearance to the false stripe disease

of barley was observed on a plot of registered Alaska oats, at the Experimental Farm, Ottawa, Ont. All culms of a plant were affected, leaves and leaf sheaths turning pale reddish yellow. Only fungi that were considered secondary were found fruiting on the older leaves. Infection was estimated to be one per cent.

LEAF SPOT - Cause unknown

A leaf spot of oats was reported in 23 fields out of 127 examined in Sask., but light infections were present in many others. Sometimes 30 per cent of the leaves were spotted. No estimate of the damage was made.

ERGOT - Claviceps purpurea (Fr.) Tul.

B.C.-

Oats were occasionally attacked by ergot on Vancouver island and the lower mainland.

Alta.-

Oats were found infected with ergot at Edmonton.

POWDERY MILDEW - Erysiphe graminis DC.

Powdery mildew was general on Vancouver island and the lower mainland. Oats were severely damaged in the seedling stage, but the pathogen was incapable of causing appreciable damage to the maturer plants.

BARLEY

STEM RUST - Puccinia graminis Pers.

Alta.-

Traces of stem rust were reported from zones 8-10.

Sask.-

Stem rust was slightly lighter on barley than on common wheat through east central Saskatchewan.

Man.-

Traces of stem rust were first observed about July 17, on barley in the Red River valley. Within a period of two weeks it had become quite prevalent through central and southern Manitoba. By harvest time barley was heavily rusted especially in the Red River valley. The crop was more heavily rusted than it had been for several years, even when stem rust had been severe on wheat.

Barley

Damage was estimated to be less than 5 per cent.

Ont.-

Most of the barley crop escaped serious infection in southern Ontario. However late sown barley was severely attacked.

N.B.-

General observations indicated that stem rust was widespread. The infection was fairly heavy.

P.E.I.-

Stem rust caused moderate infection of late barley in Queens county.

LEAF RUST - Puccinia anomala Rostr.

B.C.-

Leaf rust was common and quite severe on Vancouver island and the lower Fraser valley.

Man.-

A very light infection of leaf rust of barley occurred throughout southern Manitoba. In many fields 100 per cent of the plants were infected. This rust has never been previously so prevalent in Manitoba.

STRIPE RUST - Puccinia glumarum (Schm.) Erikss. & Henn.

B.C.-

Stripe rust was found only occasionally on Vancouver island.

Alta.-

Stripe rust was collected on O.A.C. 21.

LOOSE SMUT - Ustilago nuda (Pers.) Rostr.

Alta.-

Very little loose smut was present. It was found in 7 fields out of 108 examined in zones 5 and 10. Infections were as follows: 5 fields, a trace; 1 field, 5 per cent; and 1 field, 20 per cent.

Sask.-

Out of 12 fields examined, traces of loose smut were found in 10 and slight infections in 2.

Man.-

Loose smut was found in 22 fields out of 26 examined. The

Barley

estimated average damage was one half of one per cent, the disease being most prevalent in zones 1-3.

Ont.-

Loose smut was prevalent in southern Ontario as O.A.C. 21, the most commonly grown variety, is very susceptible. Success is also susceptible. Infections varying from one half to 4 per cent were observed in Carleton county.

N.B.-

Loose smut was general, but it was of little importance in York county.

N.S.-

In the only field of barley examined, 8 per cent of the heads were infected.

P.E.I.-

A trace of loose smut was found in Charlottetown .80 in Queens county.

COVERED SMUT - Ustilago Hordei (Pers.) Kellerm. & Swingle

Alta.-

Covered smut was extremely common and destructive. Several fields were observed where the infection was 40 to 50 per cent of the heads. O.A.C. 21 was most frequently affected. Thirty-five out of 108 fields were affected in zones 3-4 and 7-11.

Sask.-

Out of 72 fields examined 12 contained a trace of covered smut; 5, a slight infection; and 2, a moderate infection. About 25 per cent of the heads were smutted in a small Experimental plot at Saskatoon.

Man.-

Covered smut was found in 22 out of 32 fields examined. The estimated average damage was 2 per cent. The average damage by zones was reported as follows: zone 4, 5 per cent; zone 2, 4 per cent; zone 8, 3 per cent; zone 1 and zone 7, 2 per cent; zone 3, 1 per cent and zone 5, a trace. Many farmers have stated that their thrashed barley was heavily contaminated.

Ont.-

Little covered smut was present in southern Ontario. Experiments at the Ontario Agricultural College Farm showed that O.A.C. 21, Lyon, Trebi and Success were resistant to covered smut, while White Hulless, Hanchen, French Chevalier, Plumage and Archer were susceptible.

Barley

One per cent of heads were destroyed by covered smut in a field in Carleton county.

P.E.I.-

Trace of covered smut was observed in Queens county.

STRIPE - Helminthosporium gramineum Rabh.

Alta.-

Stripe was abundant in Experimental plots and it was occasionally severe in fields in the country. In general, however, the damage was slight. Stripe was found in 25 out of 108 fields examined. Infections were as follows: 18 fields showed a trace; 3, slight infection; and 4, heavy. In one of the latter 20-30 per cent of the plants were affected.

Sask.-

Stripe was reported in 3 out of 72 fields examined. Damage varied from a trace to slight. In the University plots, Saskatoon, stripe was most severe on variety "60-day."

Ont.-

Stripe was less prevalent in 1930 than for many years. This fact is attributed to the dry weather following seeding.

N.B.-

Barley stripe was reported as widespread and severe in York county.

FALSE STRIPE - Cause undetermined.

Sask.-

Very little false stripe was observed this year. A few plots in the variety tests at Indian Head were slightly affected.

Ont.-

A trace of false stripe was found in plots of hybrid material at the Experimental Farm, Ottawa.

P.E.I.-

In the rod row plots at the Experimental Farm, Charlottetown 50 per cent of plants were affected.

BACTERIAL BLIGHT - Pseudomonas translucens J.J. & R.

Alta.-

Bacterial blight was observed on Regal and O.A.C. 21 at

Saskatoon. Infections were present on the leaves and culms. It was reported in the general survey of the province in 2 fields out of 72 examined. Five per cent of the plants were infected in one field.

NET BLOTCH - Pyrenophora teres (Died.) Drechs1.
(Helminthosporium teres Sacc.)

Alta.-

A trace of net blotch was found in 15 fields out of 108 examined in zones 7, 9 and 10 only.

Sask.-

Net blotch was found in 55 fields out of 84 examined; in 17 fields there was a trace; in 8 infection was slight; in 11 moderate; and in 19 severe.

Man.-

Net blotch was reported in 9 fields. In general, the infection was a trace in these fields, but spots were found, where the plants were severely infected.

N.B.-

Slight infection of net blotch was reported on O.A.C. 21. The disease was not important this season.

P.E.I.-

Net blotch was present in head row plots at the Experimental Station, Charlottetown, but the crop was not seriously affected.

SPOT BLOTCH - Helminthosporium sativum P.K. & B.

Alta.-

Traces of spot blotch were reported in 2 fields.

Man.-

Traces of spot blotch were found in 2 fields.

FOOT AND ROOT ROT

Sask.-

Traces of take-all were reported in 8 fields out of 96 examined.

Prematurity blight was found once. This disease is rarely found on barley.

Browning root rot (Pythium spp.) was observed in 3 fields out of 98 examined. The disease is usually less conspicuous on

Barley

barley than on wheat.

Root rot of the Helminthosporium-Fusarium type was present in 89 fields out of 98 examined. The diseased fields were grouped as follows: trace, 7 fields; light, 2; moderate, 31; severe, 49.

Man.-

Helminthosporium-Fusarium root rot was reported from 29 fields out of 33 examined. The average percentage of infection by zone was; zone 1, 15 per cent; zone 2, 20 per cent; zone 3, 10 per cent; zone 7, a trace.

Ont.-

Foot rot and spot blotch was severe in the variety plots at the Experimental Farm, Ottawa. All varieties were affected, but 20 and 50 per cent of the plants were killed in the seedling stage in Wash. 238 and Wash. 113 respectively.

HEAD BLIGHT - Fusarium spp.

N.B.-

A trace of head blight was reported on O.A.C. 21 at the Experimental Station, Fredericton.

SCALD - Rhynchosporium Secalis (Cud.) Davis

Alta.-

Scald was reported from 6 fields out of 36 examined. Certain varieties, for example Alberta Beardless, were heavily attacked. In general, however, scald infections were light.

ERGOT - Claviceps purpurea (Fr.) Tul.

Sask.-

A trace of ergot was observed at Rosthern.

N.B.-

A trace was collected in a plot of O.A.C. 21 at the Experimental Station, Fredericton.

POWDERY MILDEW - Erysiphe graminis DC.

Alta.-

A trace was observed on barley.

Ont.-

Powdery mildew was very heavy on barley through southern

Ontario.

P.E.I.-

A slight infection of powdery mildew was present in Queens county.

RYE

STEM RUST - Puccinia graminis Pers.

Man.-

A trace of stem rust was collected in zones 4 and 5.

LEAF RUST - Puccinia dispersa Erikss.

Sask.-

A trace of leaf rust was found at Indian Head.

Man.-

Leaf rust was quite common in Manitoba this year, but it was not sufficiently heavy to damage the crop.

Ont.-

Traces of leaf rust were observed in Carleton county.

STEM SMUT - Urocystis occulta (Wallr.) Rabh.

Sask.-

An outbreak of stem smut occurred this year. It was found in 19 fields out of 84 examined. The centre of infection was in an area embracing Belcaires, Lemberg and Neudorf, although smut was found also at Mortlach and Fairlight. (See Fig. 3). Infections varied from a trace to 11 per cent. As far as known stem smut has been observed only once previously in Saskatchewan when Dr. Simmonds collected it several years ago.

Man.-

A trace of smut was found in one field near Carman. In 1925 it was collected at Carman and at Emerson, where 10 per cent of the heads was found infected in one field.

ERGOT - Claviceps purpurea (Fr.) Tul.

Alta.-

A trace was found in two fields out of 32 examined.

Sask.-

A trace of ergot was reported in 8 fields of fall rye out

Rye

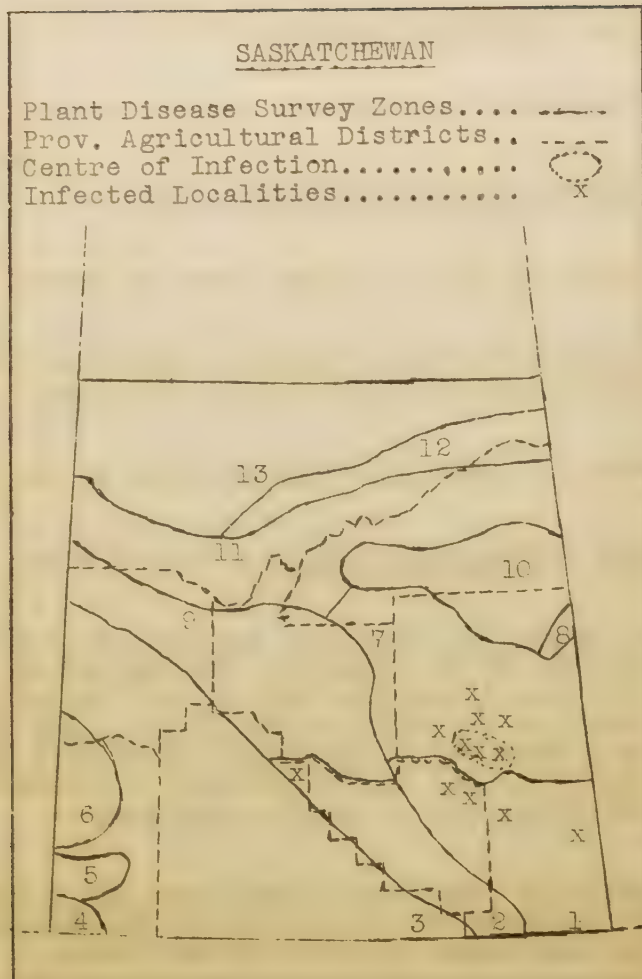


Fig. 3. Distribution of rye smut in
Saskatchewan in 1930.

Rye

of 38 examined. A trace was also observed in two fields of spring rye.

Man.-

A trace was present in most fields examined. In a field in zone 8, over 1 per cent of the heads were infected.

FOOT AND ROOT ROT

Sask.-

Prematurity blight was found in 2 fields out of 39 examined. The disease is uncommon in rye.

Browning root rot (Pythium spp.) was reported in one field out of 87 examined. Only a trace of infection was found.

Helminthosporium-Tusarium root rot was found in 74 out of 87 fields. The rate of infection was classified as follows: Trace in 3 fields; slight in 4; moderate in 19; and severe in 48.

Man.-

A few infected plants were found in a field in zone 8.

POWDERY MILDEW - Erysiphe graminis DC.

Alta.-

A trace of powdery mildew was reported in one field.

Sask.-

At Ituna a field was found where the lower leaves of the plants were heavily infected with a mixture of powdery mildew and secondary fungi.

BACTERIAL BLIGHT - ?Pseudomonas translucens J.J.R. var. Secalis (R.G. & J.) Stapp

A bacterial blight of rye culms was fairly common in Saskatchewan. Sometimes the stems were profusely lesioned, but the disease did not appear to be doing much damage. At Saskatoon some plants of fall rye were almost a total loss due to a combination of causes. Dry winds at heading time were followed by hail. The heads were then attacked by a disease similar to black chaff of wheat.

CEREALS

FROST INJURY - Non-parasitic

Ten degrees of frost was recorded by the University observer the night of May 15, at Saskatoon, Sask. The next day seedlings showed purplish to yellow areas on the first leaf, mainly at the point of most rapid growth.

INJURY FROM SOIL DRIFTING - Non-parasitic

A high south-east wind (maximum velocity of 43 miles per hour) blew for one and one half days, May 24 and 25, at Saskatoon, Sask. As a result soil drifting caused severe injury to seedlings in the University plots and to fields in several districts near Saskatoon, notably around Hague and Clavet. Wheat appeared to recover better than other cereals on our plots (R.C. Russell).

CHEMICAL INJURY - Non-parasitic

Patches of cereals of varying sizes were partially or wholly killed out in the seedling stage in Saskatchewan by sodium chlorate present in the soil. The chlorate had been applied to these spots last year to kill the weeds. Similar after effects were noticed following the use of Altacide. The autumn and spring were very dry.

DISEASES OF FORAGE AND FIBRE CROPS

ALFALFA

LEAF SPECK - Pseudopeziza medicaginis (Lib.) Sacc.

B.C.-

Leaf speck was general on Vancouver island and in the lower Fraser valley, although the damage was insignificant.

Alta.-

The disease was common and sometimes caused severe leaf drop in certain varieties. It was, however, apparently not as prevalent this year as in 1928 and 1929.

Sask.-

A light infection was observed on the leaves of alfalfa in the University plots, Saskatoon.

Que.-

In the fields, where leaf speck was found, in Hull, Sherbrooke and Kamouraska counties 50 to 100 per cent of the leaves were attacked. No noticeable damage was observed.

N.B.-

Several varieties of alfalfa were moderately infected at the Experimental Station, Fredericton.

P.E.I.-

Leaf speck caused some yellowing of the leaves in Queens county.

OTHER DISEASES

ROOT ROT - Sclerotinia Trifoliorum Erikss.

This disease was reported from Pemberton Meadows, B.C.

BACTERIAL BLIGHT - Pseudomonas medicaginis Sackett

Slight damage was reported from 3 fields in the Lethbridge district (zone 2), Alta. Alfalfa severely affected by a bacterial disease was also found in zone 4.

ASCOCHYTA SPOT - Ascochyta Heliloti (Trel.) Davis

This disease is common, and at times severe, in Alberta. Blight to medium damage was also reported from Saskatoon, Sask. Nail wounds on the stem served as admirable infection courts.

BROWN ROOT ROT - Plenodomus Heliloti Dearn. & Sanford

For injury to alfalfa see under sweet clover.

Alfalfa

WHITE SPOT - Non-parasitic

This disease was reported from Deux Montagnes county, Que.

DOWNY MILDEW - Peronospora Trifoliorum de Bary

Although this disease is of general occurrence in P.E.I. it is not important.

RUST - Uromyces Medicaginis Pass.

Although this rust is of rare occurrence, it apparently caused some injury this year in P.E.I.

COMMON CLOVER

POWDERY MILDEW - Erysiphe Polygoni DC.

B.C.-

General on Vancouver island and in the lower Fraser valley. Damage was severe in some locations.

Alta.-

Out of 10 fields examined, two were found to be infected with mildew. The damage was not heavy although the disease was probably fairly common.

Ont.-

A heavy, general infection caused a reduction of 50 per cent in the crop in Middlesex county.

Que.-

Powdery mildew was heavy on the second growth in Hull and Sherbrooke counties, but it probably caused little damage.

N.B.-

Powdery mildew was severe throughout the province. The damage was not estimated.

N.S.-

In Kings county the second crop of clover showed a considerable amount of late infection, but it was not appreciably injured.

P.E.I.-

Red clover was infected 100 per cent in Queens county. The heavy infection caused the leaves to dry up prematurely and may have been responsible for the failure of the crop to set seed;

RUST - Uromyces Trifolii (Hedw. f.) Lev.

Alta.-

Light, general infections were reported in fields at Entwistle and at the Experimental Station, Lethbridge.

Ont.-

Rust was observed on alsike clover in Carleton county. Out of 3 fields examined, in one 20 per cent of the leaves were infected, in another 10 per cent and in a third no rust was observed. In the two infected fields small patches were found where not only the leaves, but also the stems were rusted.

N.S.-

Rust appeared to be fairly common, but it apparently caused little loss. Slight infection, was reported from Digby, Pictou and Colchester counties, while a 40 per cent infection was observed in Kings county.

PSEUDOPETIZA LEAF SPOT - Pseudopeziza Trifolii Fuck.

This disease was fairly common in both Antigonish and Colchester counties, N.S., although the damage was slight. One slight infection was observed in P.E.I.

CERCOPORA LEAF SPOT - Cercospora lebrina Pass.

Cercospora leaf spot was found in 2 fields in Carleton county, Ont., 10 and 50 per cent of the leaves, respectively, being infected.

SOOTY SPOT - Dothidella Trifolii (Pers.) Bayl.-Elliott & Stansf.
(Polythrincium Trifolii Kunze)

B.C.-

Sooty spot was general on Vancouver island and the lower Fraser valley, although it caused little damage.

N.B.-

A light infection was reported from the Experimental Station, Fredericton.

P.E.I.-

A light scattered infection was observed in Queens county.

DOWNY MILDEW - Perenospora Trifoliorum de Bary

Heavy infections of downy mildew were reported from five fields of clover at Ste. Anne de la Pocatière, Que.

MOSAIC - Virus

Only a very few plants attacked by mosaic, were observed at Fredericton, N.B. A single affected plant, stunted and yellow was found late in the season in Queens county, P.E.I.

SWEET CLOVER

BROWN ROOT ROT - Plenodomus Heliloti Dearn. & Sanford

For injury caused by brown root rot on common clover see under sweet clover.

LEAF SPOT AND STEW CANCER - Ascochyta Heliloti (Frel.) Davis

Slight damage due to this disease was reported from Aberdeen and Saskatoon, Sask.

A light scattered infection was also observed at Becketts Landing, Ont.

MOSAIC - Virus

Mosaic caused a slight amount of damage at Summerland, B.C. Two clumps of sweet clover on the roadside near Ottawa, were infected with mosaic, while Medicago lupulina growing near by was free. This disease was also reported from Becketts Landing, Ontario.

BROWN ROOT ROT - Plenodomus Heliloti Dearn. & Sanford

Alta.-

Brown root rot was not as destructive this year as in 1929, although this disease was fairly common and in places severe. It was found also on common clover and alfalfa.

Sask.-

An infected plant was found on the roadside near Saskatoon.

SCLEROTINIA ROOT ROT - Sclerotinia Trifoliorum Erikss.

This root rot was reported from the lower Fraser valley, B.C. Damage was slight.

The indications are that losses from Sclerotinia may be greater than commonly realized in Alberta. Infection of the soil is common and widespread. (Sanford)

CORN

SMUT - Ustilago Zeae (Beck.) Ung.

Alta.-

A slight infection was reported from Brooks, where the disease had been observed in 1928 and 1929.

Sask.-

This disease is not often troublesome in Sask. It was reported on garden corn at Indian Head and Whitewood.

Man.-

Smut was reported in 4 fields; in zone 3 one field had 50 per cent of the hills infected and a second with 10 per cent of the ears smutted; in zone 1, only a trace was present in 2 fields.

Ont.-

Only a slight infection was observed in Lincoln county.

N.B.-

Two per cent of the plants at the Experimental Farm, Fredericton, were infected. The disease occurred widely throughout the province, but it caused only slight damage.

RUST - Puccinia Sorghi Schw.

Corn rust was quite general in the Red River valley, Man. Infections, however, were too light to cause any appreciable damage.

Very small localized infections were observed at the Experimental Farm, Charlottetown, P.E.I.

BLIGHT - Fusarium sp.

This disease seems to result in poorly developed ears in P.E.I.

FLAX

WILT - Fusarium Lini Holley

Alta.-

Wilt was not observed on flax this year.

Sask.-

Of 3 fields examined all were affected with wilt, two lightly and one moderately. This disease was also reported from Dollard and Yellow Grass.

Man.-

Out of several fields examined, two were found to be badly infected with wilt, the damage amounting to 25 per cent.

N.B.-

Only three affected plants were observed in York county.

RUST - Melampsora Lini (Pers.) Desm.

Only one field out of 21 examined in Sask. showed any

Flax

infection and in this one the damage was negligible.

A trace of rust was also observed in four fields in Manitoba.

HEAT CANKER - Non-parasitic

This disease caused severe damage in the University plots, Edmonton, Alberta.

At the Experimental Farm, Ottawa, Ont., up to 50 per cent of the plants of several varieties were destroyed by heat canker.

From the University of Saskatchewan, Saskatoon, T. C. Vanterpool reported a root rot of flax, from which Fusarium, Rhizoctonia and Alternaria were isolated.

SUNFLOWER

WILT - Sclerotinia Sclerotiorum (Lib.) de Bary

B.C.-

General on Vancouver island and in the lower Fraser valley. When rotation is not practised the damage is severe.

Sask.-

Sunflower wilt was reported from Saskatoon and Alameda. At the latter place 15 per cent of the plants were dead.

Man.-

Wilt was apparently quite common in Manitoba this year. Many fields in zone 1 were badly damaged. In one field the areas were large, where all the plants were destroyed. In another field 30 per cent of the plants were killed.

N.B.-

Only two specimens of wilt were observed in a field near the Experimental Station, Fredericton.

N.S.-

In a varietal test of 450 pure lines at Kentville, infection varied from 0 - 70 per cent. In one case the head was infected, in all others the infections were of the crown or stem type.

RUST - Puccinia Helianthi Schw.

Sask.-

Traces of the aecial stage were found on cultivated sunflower at Saskatoon and Indian Head while a trace of the uredenial stage was present in August at Indian Head.

Man.-

This rust was common throughout Manitoba and was quite severe in some fields.

N.S.-

In a varietal test at Kentville, varying amounts of rust were present on a large number of pure lines. Some showed as much as 50 per cent of the foliage affected. A few lines showed appreciable resistance.

LEAF SPOT - Septoria Helianthi Ell. & Kellerm.

The majority of the pure lines under test for wilt resistance at Kentville were susceptible to leaf spot, but only a few lines were injured.

CULTIVATED GRASSES

Awnless Brome (Bromus inermis)

Leaf spot (Septoria bromigena Sacc.) Light to heavy infections were present in most fields inspected in Saskatchewan. The damage was slight.

Scald (Rhynchosporium Secalis (Oud.) Davis) was general in the Clive district (zone 10), Alta.

Ergot (Claviceps purpurea (Fr.) Tul.) was found occasionally on Vancouver island and in the lower Fraser valley, B.C.

It was reported from Edmonton, Alta.

Ergot was found at Saskatoon, Sask. and in the south eastern part of the province it has been frequently noticed along the roadsides and spreading into adjoining fields of rye.

Smut (Ustilago bromivora Tul.) Common on Vancouver island B.C.

Timothy (Phleum pratense)

Rust - (Puccinia graminis Pers. var. Phlei-pratensis (Erikss. & Henn.) Stakm. & Piemeisel) caused severe damage in some sections of B.C.

Common, but slight infections were reported from Alta.

Slight and scattered rust infections were observed in Colchester, Antigonish, and Digby counties N.S.

Rust appeared late in the season in P.E.I. Only scattered infections were observed.

Smut - (Ustilago striaeformis (Westend.) Niessl) A trace of timothy smut was observed along the edge of a field, Lanotick, Ont.

Ergot - (Claviceps purpurea (Fr.) Tul. was occasionally found on Vancouver island, B.C.

Reported also from Edmonton, Alberta.

Western Rye Grass - (Agropyron tenerum)

Smut (Ustilago bromivora (Tul.) Fisch.) caused medium damage at Lloydminster, Alberta.

Moderate damage from smut was reported in one field near Venn, which had 10 per cent of the plants infected, and also in a plot at the University Farm, Saskatoon, Sask., showing 25 per cent of the plants smutted.

Rust - (Puccinia Clematidis (DC.) Lagerh.) caused very slight damage at Quill Lake, Sask.

Ergot - (Claviceps purpurea (Fr.) Tul. was observed at Edmonton, Alberta.

Sudan Grass (Holcus Sorghum sudanensis)

Bacterial? Leaf spot (Bacillus Sorghi Burr.) was observed on the Experimental Farm at Saskatoon and Indian Head, Sask. In some cases the infections were heavy, but the damage was light.

Broom Millet (Panicum miliaceum)

Smut (Sorosporium Panici-miliacei (Pers.) Takah.) A slight infection was observed in Alberta.

In a small plot at the Experimental Farm, Indian Head, Sask. 5 per cent of the heads were affected.

Fescue (Festuca spp)

Rust (Puccinia graminis Pers.) was quite common on Vancouver island, although the damage was slight.

MISCELLANEOUS CROPS

Buckwheat

A heavy and general mottling of the leaves, possibly due to a virus, was observed at Kentville Agricultural School, Ont. The affected plants appeared vigorous.

Vetch

A bacterial blight was common and apparently destructive on pearl vetch at the Experimental plots, Olds, Alberta.

DISEASES OF VEGETABLE AND FIELD CROPS

ASPARAGUS

RUST - Puccinia Asparagi DC.

Sask.-

A heavy infection occurred on rows in a sheltered spot in the University garden, Saskatoon, while the main asparagus bed appeared to be free from rust.

Man.-

Some heavily infected plants were collected at Newdale.

Ont.-

A medium infection of rust was reported from Lincoln county.

N.B.-

Only one plant was found infected at the Experimental Station, Fredericton.

BEAN

MOSAIC - Virus

B.C.-

Ten to twenty-five per cent of the plants were affected in the Okanagan valley and the lower mainland.

Alta.-

Mosaic was found in 5 fields out of 20 examined. The heaviest infection observed was at the Experimental Station, Lethbridge. Mosaic in a severe form is fairly common.

Sask.-

Five to ten per cent of the plants were affected in a garden at Saskatoon; the damage was slight. The plants were stunted, late and podless.

N.B.-

Ten per cent of the plants were affected with mosaic in a plot of several varieties, Experimental Station, Fredericton.

ANTHRACNOSE - Colletotrichum Lindemuthianum (Sacc. & Magn.)
Bri. & Cav.

Alta.-

Anthracnose caused only slight damage at Edmonton.

Bean

Que.-

The disease was first observed on June 20; ordinarily it does not appear till later. Only a trace was present at that time in Jacques Cartier and Rouville counties. The estimated average infection was 10 to 25 per cent in 3 fields examined in the Quebec district at a later date.

N.B.-

Anthracnose was widespread but of slight importance in 1930. A moderate infection was reported from the Experimental Station at Fredericton.

N.S.-

Anthracnose caused an average damage of 5 per cent in Kings county. The disease spread slowly this year.

P.E.I.-

All varieties are attacked by this disease, some more severely than others. It is usually severe in small gardens.

BACTERIAL BLIGHT - Pseudomonas Phaseoli E.F.Sm.

Alta.-

This is a very common disease in Alberta, being observed in 26 out of 30 fields examined in 1930. The estimated average damage was 6.5 per cent, although at Olds the crop was a total loss.

Sask.-

Bacterial blight was present in field beans to a very slight extent in the Indian Head district in 1930, but many varieties of garden beans at the Experimental Farm were severely infected and in some cases completely defoliated.

Man.-

In one field near Charleswood, 100 per cent of the plants were infected. No other cases were reported.

N.B.-

A slight infection was reported from the Experimental Farm at Fredericton.

N.S.-

A large number of varieties of beans were infected in Kings county; the estimated damage was 15 per cent.

P.E.I.-

Only one slight infection was observed in Queens county.

MISCELLANEOUS DISEASES

STEM ROT - Rhizoctonia spp.

Stem rot was common and frequently severe in Alberta.

WILT - Sclerotinia Sclerotiorum (Lib.) de Bary

This disease was widespread and caused considerable damage throughout N.B. A severe infection was observed at the Experimental Station and in two gardens in Fredericton.

WILT - Botrytis cinerea Pers.

Although this wilt was destructive in the St. John valley, N.B. in 1928 and 1929, when the loss was estimated to be 15 per cent of the crop, it was of slight importance this year.

RUST - Uromyces appendiculatus (Pers.) Lév.

Sixty per cent of the foliage was rusted in White Pole beans, in Kings county, N.S. The rust was late in appearing and little developed on other varieties. This disease was not as severe in P.E.I. as it has been in wetter seasons.

ROOT ROT - Pythium spp.

A trace of root rot was found in a low lying spot in a plot of peas, Saskatoon, Sask. The species of Pythium responsible has not yet been determined (T. C. Vanterpool).

BROAD BEAN

STEM ROT - Cause unknown

About one half of one row of broad beans in the University garden, Saskatoon, was killed by an unknown disease. The stems turned black at the base and rotted off.

BETT

ROOT ROT - Rhizoctonia Solani Kühn.

One specimen was sent to the Laboratory at Fredericton N.B. for identification.

LEAF SPOT - Phoma Betae (Oud.) Frank

This disease was general on Vancouver island and the lower Fraser valley, B.C. The damage from seedling wilt was considerable.

Several varieties were severely infected at the Experimental Station, Fredericton, N.B.

SCAB - Actinomyces scabies (Thaxt.) Güssow

Scab was observed in Alberta. A slight infection was also observed in a small garden in P.E.I.

CABBAGE

CLUB ROOT - Plasmodiophora Brassicae Woron.

B.C.-

In over half the fields in the Armstrong district, 50 to 80 per cent of the plants were affected with club root. The disease was also severe in one garden in Victoria.

N.B.-

Three per cent of the plants were severely infected in the Experimental plots, Fredericton.

P.E.I.-

One per cent of the plants were destroyed in a small garden in Queens district. The disease was not important this year.

BLACK ROT - Pseudomonas campestris (Pamm.) E.F.Sm.

Fifteen per cent of the plants in a field containing 500 plants were destroyed in Nicolet county, Que.

CANTALOUPE

BREAKDOWN - Non-parasitic

This disease causes some trouble in the Oliver district,
B.C.

SCLEROTINIA ROT - Sclerotinia Sclerotiorum (Lib.) de Bary

Seventy-five per cent of the fruit kept in a storage house at the Experimental Station, Fredericton, N.B. were infected on Sept. 25.

CARROT

SCLEROTINIA ROT - Sclerotinia Sclerotiorum (Lib.) de Bary

Fifty per cent of the locally grown carrots in storage were destroyed by this rot in the Edmonton district.

A few specimens were found in a storage house in York county, N.B.

CAULIFLOWER

CLUB ROOT - Plasmodiophora Brassicae Woron.

Fifteen to 20 per cent of the plants of Stoke's Erfaut were severely diseased in Lincoln county, Ontario. A second variety growing along side was not attacked. The soil was gravelly and light. Two per cent of the plants were slightly affected in the Experimental plots, Fredericton, N.B.

BLACK ROT - Pseudomonas campestris (Pa m.) E.F.Sm.

A heavy infection, causing a loss of 75 per cent, was observed in Nicolet county, Que.

CELERY

LATE BLIGHT - Septoria Apii Chester

Man.-

All the plants in a field just north of Winnipeg were severely infected.

Ont.-

A light infection was observed in Lincoln county; the damage was negligible.

Que.-

A moderate to severe infection in Nicolet county caused a loss of 25 per cent of the crop.

N.B.-

A moderate infection was reported from the Experimental Station, Fredericton. This disease is quite general in the St. John valley.

P.E.I.-

Losses were very heavy on all varieties. The plants were sprayed but infrequently with Bordeaux, which may account for the lack of control.

YELLOWS - Fusarium spp.

Celery was slightly damaged by yellows at Armstrong, B.C.

HEART ROT - Non-parasitic

Seventy-five per cent of the celery was affected with heart rot and rendered unfit for market in Wentworth county, Ontario.

SOFT ROT - Bacillus carotovorus L.R. Jones

Several gardens were badly infected in the vicinity of Victoria, B.C.

CUCUMBER

FRUIT SPOT (SCAB) - Cladosporium cucumerinum Ell.& Arth.

Que.-

A loss of 10 per cent of the crop was reported at Nicolet

Cucumber

county. About 50 per cent of the leaves were infected.

N.B.-

Heavy infections were reported from York, Sunbury, and Kings counties. This disease was widespread and is probably the limiting factor in the growing of cucumbers.

BACTERIAL WILT - Bacillus tracheiphilus E.F.Sm.

A scattered infection was reported in 2 greenhouses in southern Ontario. In the one at Kingsville, the disease probably became severe.

MOSAIC - Virus

Only two specimens were found at the Experimental Station, Fredericton, N.B.

Although this disease occurs regularly every year on all varieties in P.E.I. only rarely has any severe injury been observed.

EGG PLANT

PHOMOPSIS BLIGHT - Phomopsis vexans (Bacc. & Syd.) Harter

This disease took the form of a wilt of 1 to 2 per cent of the plants in the Okanagan district, B.C.

WILT - Verticillium sp.

Fifty per cent of the plants were affected with wilt in a field in Lincoln county, Ontario. The disease caused a reduction in the size and number of fruits.

JERUSALEM ARTICHOKE

WILT - Sclerotinia Sclerotiorum (Lib.) de Bary

A trace of wilt was observed in the Experimental Station garden, Fredericton, N.B.

LETTUCE

DROP - Sclerotinia Sclerotiorum (Lib.) de Bary

In one field near Winnipeg, Man. about 5 per cent of the heads were damaged. A slight infection was also reported from N.B., where the disease is widespread but caused only slight damage.

GRAY MOULD - Botrytis cinerea Pers.

Gray mould was general on Vancouver island, B.C.

TIPBURN - Non-parasitic

Slight damage from tipburn was reported from the Okanagan district, B.C.

ONION

NECK ROT - Botrytis Allii Munn

Five per cent of the crop of Yellow Globe and Danvers was destroyed in the Okanagan valley, B.C. This represents a loss of 500 tons of onions valued at \$10,000.

Neck rot is an important disease in P.E.I. Heavy losses occur in Yellow Globe, Danvers, Large Red Weathersfield and Red Globe.

BULB ROT - Fusarium sp.

About 5 per cent of the crop was lost in the Kelowna district, B.C.

PEA

POWDERY MILDEW - Erysiphe Polygoni DC.

Alta.-

This disease is common late in the season.

N.B.-

A slight infection was reported from the Experimental Station, Fredericton. The disease was general but of no importance.

P.E.I.-

Heavy infection and severe injury was observed in the following varieties; American Wonder, Thomas Laxton and Sutton Excelsior.

ROOT ROT - Fusarium spp.

Root rot is a common and important disease of peas in Alberta.

Scattered infections were observed in many of the canning areas of Ontario. Harsford Laxtonian, Thomas Laxton, Alaska and Rogers Winner are susceptible while Green Admiral, Yellow Admiral and Haral are resistant (R. E. Stone).

LEAF and POD SPOT - Ascochyta Pisi Lib.

Alta.-

The losses in Alberta due to this disease are not serious.

Pea

Sask.-

A trace was found on the pods this year at Saskatoon. Two years ago the disease was heavy in the same place, but the last two seasons have been dry.

N.B.-

A moderate infection was reported from the Experimental Station at Fredericton. This disease is an important limiting factor in the production of this crop.

LEAF BLOTCH - Septoria Pisi West.

Leaf blotch was common in Alberta although no damage was evident.

Slight damage was observed on both field and garden peas at Indian Head, Saskatchewan.

MISCELLANEOUS DISEASES

BLOSSOM BLIGHT - Alternaria spp.

Fifteen per cent of the blossoms were blighted in a field in Lincoln county, Ontario.

ROOT ROT - Pythium sp.

A trace of root rot was observed at Saskatoon, Sask. The disease was confined to a low spot in the field. The species of Pythium responsible has not yet been determined.

RUST - Uromyces Fabae (Pers.) de Bary

A moderate infection was reported in the Experimental Station garden, Fredericton, N.B.

MOSAIC - Virus

One per cent of the plants were affected in a field in Kings county, N.S.

DOWNY MILDEW - Peronospora Viciae (Berk.) de Bary

Five per cent of the plants were affected in several varieties of canning peas growing in the Fraser valley, B. C. The damage was negligible.

PEPPER

BLOSSOM END ROT - Non-parasitic

Fifteen per cent of the crop was affected at Morden Man. Alternaria was found on many of the diseased spots.

Ten to 15 per cent of the fruit were affected by blossom and rot in a field in Lincoln county. Diseased fruit were useless.

POTATO

Before considering the different diseases by provinces, a few facts are presented on certain diseases as they affect Canada as a whole. These data were obtained from summaries prepared from observations made by the Potato Inspectors during their examination of fields of potatoes grown from certified seed. Out of 9707 fields, which were planted with certified seed and inspected, 2411 fields or 24.8 per cent were rejected on account of disease or other causes. On an acreage basis 19 per cent failed to pass inspection. Of the fields rejected on account of disease mosaic was responsible for 53 per cent of the rejections. Black leg was second with 9.4 per cent and leaf roll third with 5.6 per cent. In addition 11.6 per cent were rejected on account of being adjacent to diseased fields.

The above diseases were not equally prevalent in every province. Mosaic was most prevalent in N.B., N.S., Alta., P.E.I., and B.C., infection in the rejected fields varying from 5.8 per cent to 2.9 per cent respectively. Leaf roll was most destructive in N.S. and Alta., while black leg was most prevalent in Sask. and Man.

LATE BLIGHT - Phytophthora infestans (Mont.) de Bary

Que.-

In a half acre field of Green Mountains, one per cent of the tubers were left in the field on account of tuber rot.

N.B.-

Late blight was most prevalent in Victoria and Sunbury counties although, some injury occurred in almost every county. In general the infection was slight to moderate.

N.S.-

Only a small amount of tuber rot was observed in Colchester county. One lot of Garnet Chili, where the crop had not been sprayed showed 2 per cent, and 2 lots of Irish Cobblers, 1 and 3.5 per cent respectively. Twenty other lots of each variety were practically free.

RHIZOCTONIA - Corticium Solani (Prill. & Del.) Bourd. & Galz.

Man.-

Rhizoctonia was quite common in Manitoba. However, only a trace was present in most fields examined. In a field at Virden,

Potato

25 per cent of the plants were affected.

N.B.-

Rhizoctonia was present on all varieties. In general the infections were slight, except in Madawaska and Victoria counties, where 25 per cent of the fields were moderately infected. Tuber infection was correspondingly higher in these counties than the rest of the province.

N.S.-

Rhizoctonia was reported on Irish Cobbler tubers from Pictou, Colchester and Halifax counties. Usually the percentage of tubers infected averaged from 6 to 8 per cent. In four lots, however, infection varied from 10 to 30 per cent.

COMMON SCAB - Actinomyces scabies (Thaxt.) Gussow

Sask.-

Scab was prevalent this year on account of the drought.

N.B.-

Moderate infections were reported on all varieties from every county.

N.S.-

It was estimated that 4.3 per cent of the tubers were affected with scab in 30 lots of potatoes examined in Colchester and Pictou counties. The highest infection recorded was 15 per cent.

BLACK LEG - Bacillus phytophthorus Appel

Sask.-

In the field inspection of certified seed potatoes, 3 fields were rejected in eastern Sask. on account of black leg. The average infection in these fields was 9.2 per cent. Only a trace was present in the fields that passed.

Man.-

Thirty per cent of the plants were infected in a field at Virden, Man. Six fields were rejected on account of black leg in the field inspection of certified seed potatoes. The average infection in these fields was 8.9 per cent, while it was 0.3 per cent in the fields that passed.

N.B.-

Black leg was most prevalent in Carleton, Restigouche and Westmoreland counties, where 2 per cent or more of the plants were diseased in some of the fields.

EARLY BLIGHT - Alternaria Solani (Ell. & Mart.) Jones & Groat

Alta.-

Early blight caused slight damage in a garden at Edmonton.

N.B.-

The disease was most prevalent on the foliage in Sunbury county, where it was also severe in 5 per cent of the fields. Over 50 per cent of the fields were slightly to moderately infected, in Restigouche and York counties.

P.E.I.-

Thirty-five per cent of the tubers were seriously affected with rot due to Alternaria Solani in a bin of Irish Cobbler in Queens county.

LEAF ROLL - Virus

Alta.-

Leaf roll caused slight damage at Brant.

N.B.-

Traces of leaf roll were reported from every county. Two per cent or more of the plants were infected in several fields in Northumberland, Carleton, Gloucester and Westmoreland counties.

MOSAIC - Virus

Sask.-

Only a trace of mosaic was observed in the 55 fields of certified seed potatoes examined.

Man.-

Out of 95 fields inspected, one was rejected for mosaic in the field inspection of certified seed potatoes.

N.B.-

Mosaic was prevalent in every county. It was most severe in Charlotte, York and Sunbury counties where of the fields inspected, 87.5, 26.0 and 36.8 per cent respectively contained 2 or more per cent of mosaic.

DRY ROT - Fusarium spp.

N.B.-

Dry rot is widespread in storage houses. Inspection of the tubers in April showed that 20 per cent were moderately affected.

Potato

P.E.I.-

Dry rot was fairly prevalent this autumn in P.E.I. Inspections made in November showed 1 per cent of the tubers affected.

MISCELLANEOUS DISEASES

SKIN SPOT - Oospora pustulans Owen & Wakefield

A trace of skin spot was found at the Experimental Station, Fredericton, N.B.

POTASH HUNGER - Non-parasitic

Potash hunger was observed in a small field of Green Mountains in York county, N.B.

TIPBURN - Non-parasitic

This disease was not severe in N.B. in 1930. Three per cent of the plants were moderately affected.

VERTICILLIUM WILT - Verticillium albo-atrum Reinke & Berth.

A single specimen was collected in York county, N.B.

CURLY DWARF - Virus

A trace was observed at the Experimental Station, Fredericton, N.B.

STREAK - Virus

One plant of Spaulding Rose was found infected at the Experimental Station, Fredericton, N.B.

SILVER SCURF - Spondylocadium atrovirens Harz.

An examination of the potatoes in storage at the Experimental Station, Fredericton, N.B. on April 3, showed that 65 per cent were affected. The disease is widespread and quite important in N.B. as it disfigures the tubers sufficiently to lower their market value.

In P.E.I. two per cent of the Irish Cobblers examined in November were affected. However, this disease develops mostly in the early spring after potatoes have been in storage for some time and usually causes considerable damage.

POWDERY SCAB - Spongospora subterranea (Wallr.) Lagerh.

From observations made on 90 farms in York county, N.B. it was estimated that the average infection was only a trace.

NET NECROSIS - Cause undetermined

A trace of net necrosis was found in Green Mountains at the Experimental Station, Fredericton, in April.

SPINDLING TUBER - Virus

Slight amounts of spindling tuber were found in several counties in N.B.

PHOMA ROT - *Phoma tuberosa* Melhus, Rosebaum & Schultz

Two per cent of the Irish Cobblers examined in November in P.E.I. were affected with dry rot following powdery scab. An appreciable loss occurs each year in storage from Phoma rot.

RHUBARB

CROWN ROT - Cause undetermined

Crown rot is common and severe in Alberta. In Sask., where this disease is widespread and very destructive, up to 50 per cent damage was reported.

LEAF SPOT - *Ascochyta Rhei* Ell. & Ev.

In Saskatoon, Sask., the spotting was more severe on the petioles, where they had been injured by hail. Nature pycnidia were collected.

Slight damage from leaf spot was reported from Queens county, P.E.I.

STEM ROT - *Botrytis* spp.

Stem rot was severe in two places in Alberta.

ANTHRACNOSE - *Colletotrichum erumpens* Sacc.

Anthracnose was found at the Experimental Station, Morden, Man. Hills here and there in the field were completely destroyed.

LEAF SPOT - *Phyllosticta straminea* Bres.

A moderate infection was reported from the Experimental Station, Fredericton, N.B. This disease is general but not serious.

RUTABAGA

CLUB ROOT - *Plasmodiophora Brassicae* Woron.

Twenty-five per cent of the plants were moderately affected with club root in York county. The disease is widespread and serious in many sections

WATER CORE OR BROWN HEART - Non-parasitic

B.C.-

This disease occurred in a small patch of about one and one half acres, containing 3 varieties at Kelowna. Ten to 75 per cent of the crop was injured depending on the variety.

N.B.-

What appears to be the same disease was very destructive in both 1929 and 1930 in York county. All varieties are affected.

SPINACH

DOWY MILDW - Peronospora effusa (Grev.) Rabh.

This disease was observed in two gardens in Saskatoon, Sask., where it caused slight damage.

Spinach was moderately infected in a patch that had been watered frequently at Kentville, N.S. Generally the disease was absent in Kings county.

BACTERIAL SOFT ROT - Bacillus ?carotovorus L.R. Jones

Two per cent of the plants were destroyed in a garden at Edmonton, Alberta.

TOBACCO

BLACK ROOT ROT - Thielavia basicola Zopp

Ont.-

Due to the hot, dry, season, losses from black root rot in Ont., were very small.

Que.-

This disease still causes considerable loss in Quebec as many farmers fail to treat their seed-bed soil. The disease may be found to some extent in at least 25 per cent of the tobacco fields.

DAMPING OFF - Pythium de Baryanum Hesse

Ont.-

In Essex and Kent counties, damping off was quite prevalent. A few cases of "sore-shin" were traced to damping off in the seed-bed.

Que.-

The usual amount of infection was reported from Quebec.

SEED-BED MOULD - Pyronema confluens (Pers.) Tul.

This saprophytic mould necessitated the reseedling of a number of seed-beds, which are semi-hot beds covered with glass, at the Experimental Station, Harrow, Ont. The disease was first noted in 1928.

WILLOW STALK - Bacillus carotovorus L.R. Jones

A few plants affected by this disease were observed in Quebec.

WILDFIRE - Pseudomonas Tabacum (Wolfe & Foster) Stev.

This disease has not spread beyond the Yamaska valley, Que. Through the co-operation of the growers, the disease was present in only one field this year and the grower in this instance had not carried out the sanitation programme recommended.

ANGULAR LEAF SPOT - Pseudomonas angulatum (Tromme & Murray) Stev.

The disease was observed only a few times; the localities were not stated.

MOSAIC - Virus

B.C.-

A marked increase was observed in the Sumas area. The damage was significant, but the disease was not general in the lower Fraser valley.

Ont.-

In Ontario mosaic was not as prevalent as it has been in the past.

Que.-

In the northern district of Que., this trouble is rather more prevalent this year, while in the Yamaska valley it is rather less abundant.

MISCELLANEOUS DISEASES

TRENCHING (non-parasitic) was reported from eastern Ontario and in the Okanagan valley, B.C.

CURLY DWARF (non-parasitic) was observed in the Okanagan valley, B.C.

LEAF DROP (non-parasitic). Seventy-five per cent of the leaves were affected in two fields near Kelowna, B.C.

LAND BROWN (Magnesium deficiency) occurred to some extent on the lighter soils in Quebec.

BROWN ROOT ROT (Cause unknown) was found to a slight extent in Essex county, Ontario.

DROUGHT INJURY - The extended drought in south western Ontario resulted in an abnormal yellowing of the Burley, and a burning of the flue-cured tobacco. Rain early in September stimulated

Tobacco

the tobacco to grow a second time. In consequence, maturity was delayed and curing was difficult, resulting in a high percentage of dark leaf and considerable rim-burn.

SHED BURN - The wet weather that occurred about the middle of September caused some damage in eastern Ontario and Quebec.

TOMATO

BLOSSOM-END ROT - Non-parasitic

B.C.-

Blossom-end rot was general all over the province and was reported as severe at the Experimental Farm, Saanichton.

Sask.-

This disease was common around Wolseley. One garden had from 60 to 75 per cent of the fruit affected.

Man.-

In the plots at the Experimental Station, Morden, 5 to 10 per cent of the plants were affected.

Ont.-

Severe damage was reported from Lincoln, Leeds, Ontario, and Halton counties. The disease was very general and severe this year due to the prolonged drought.

N.B.-

This disease was widespread in greenhouses causing considerable damage. A moderate infection was reported from the Experimental Station greenhouse at Fredericton.

N.S.-

Two to five per cent of the crop was affected in Kings county. The disease was found generally on light soil and was probably more prevalent on account of the dry weather.

P.E.I.-

A complete loss of a crop of tomatoes was observed in a commercial garden at Charlottetown. The soil was exceedingly rich and the weather was alternately wet and dry.

MOSAIC - Virus

B.C.-

Slight damage occurred in both fields and greenhouses in the Okanagan valley, B.C.

Ont.-

Infections of 25 to 35 per cent on Ignotum and 50 per cent on Early Evans were observed in Lincoln county. John Bean and Chalks Jewel growing alongside infected Early Evans, were resistant. In general, tomato mosaic was very prevalent in Lincoln county, this year.

Que.-

Seventy-five to 30 per cent of the plants were affected with mosaic in 3 large greenhouses at Côte des Neiges, Montreal. The owners claim to have lost 50 per cent of their previous crops due to mosaic and streak.

N.B.-

This disease is widespread and is an important limiting factor in tomato production. A moderate infection was observed in the Experimental Station garden at Fredericton.

STREAK - Virus

Ont.-

Fifty per cent of the plants were seriously stunted from streak and mosaic in a greenhouse in Welland county. Isolated cases of streak were also observed in the field on plants heavily infected with mosaic in Lincoln county. Potatoes growing in the immediate vicinity may have been responsible for the streaking of the mosaic infected plants.

Que.-

In a greenhouse at Côte des Neiges, Montreal a trace of streak was observed. The owners claim that the damage is worst at the 5th fruit spur stage and that in previous crops they have lost as high as 50 per cent of their crop. (See report under Mosaic.)

N.B.-

Only one specimen of streak was observed in the Experimental Station garden at Fredericton.

LEAF MOULD - Cladosporium fulvum Cke.

B.C.-

Five per cent of the crop was lost from leaf mould in a greenhouse at Summerland, B. C.

Ont.-

A very severe infection caused defoliation and reduction of vigor in a greenhouse crop in Lincoln county.

Tomato

Que.-

A few spots were reported on the lower leaves of greenhouse tomatoes at Côte des Neiges, Montreal.

EARLY BLIGHT - Alternaria Solani (Ell. & Martin) Jones & Grout.

Que.-

A late infection developed on all the leaves, but caused little damage in a field at Aylmer.

N.B.-

This disease is widespread, and where no spray was applied it was severe.

P.E.I.-

In a small garden, severe damage was reported due to the drying up of the leaves.

LEAF SPOT - Septoria Lycopersici Speg.

This disease was general in the greenhouses on Vancouver island. A light infection was also reported from P.E.I.

VERTICILLIUM WILT - Verticillium ovatum Berkeley & Jackson

One per cent of the plants were affected with wilt in Lincoln county, Ontario.

BREAKDOWN - Non-parasitic

This disease is found occasionally on some of the fruit in the Okanagan valley, B.C.

BACTERIAL CANCER - Bacterium michiganense (E.F.Sm.) Stev.

All varieties were affected, infection varying from 0 to 90 per cent in Kamloops and the Okanagan valley, B.C.

WILT - Fusarium Lycopersici Sacc.

Wilt was general but caused only slight damage in the greenhouses on Vancouver island, B.C.

ROOT KNOT - Heterodera radicumicola (Greef) Muell.

Root knot is general in the greenhouses on Vancouver island, B.C.

WESTERN YELLOW BLIGHT

This disease was general in the greenhouses on Vancouver island, B.C.

TURNIP

CLUB ROOT - Plasmodiophora Brassicae Woron.

Que.-

In one field in Isle Verte county, 10 to 15 per cent of the plants were diseased.

N.B.-

Two per cent of the plants were severely affected with club root at the Experimental Station, Fredericton.

N.S.-

Infections were very patchy in Colchester county. Out of 14 fields examined, 11 were found to be free from infection. In the affected fields the infections were 25, 50 and almost 100 per cent respectively.

POWDERY MILDEW - Erysiphe Polygoni DC.

A moderate infection of powdery mildew was reported in Queens county, P.E.I.

DRY ROT - Phoma Lingam (Tode) Desm.

This rot is present in all turnip fields in P.E.I. causing slight to heavy damage. Fields have been observed that were unfit to harvest on account of the rot.

BROWN HEART - Non-parasitic

Brown heart occurs generally throughout P.E.I. The loss due to this disease in 1930 was estimated to be \$50,000.

WHITE SPOT - Cercospora albo-maculans (Ell. & Ev.) Sacc.

Ten per cent of the plants were slightly affected in York county, N.B. The disease was not important this season in comparison with 1929 when 80 per cent of the plants were severely infected.

Turnip

BLACK ROT - Pseudomonas campestris (Pamm.) E.F.Sm.

Sixty per cent of the plants were severely infected in the Experimental Station plots, Fredericton, N.B.

MACROSPORIUM SPOT - Alternaria herculea (Ell. & Mart.) J.A.
Elliott

This leaf spot was severe on the Experimental Station plots, Fredericton, N.B.

DISEASES OF FRUIT CROPS

APPLE

SCAB - Venturia inaequalis (Cke.) Wint.

B.C.--

Scab was particularly severe in the Kootenay district this year. In three orchards the percentages of fruit infected by actual count were as follows: Fameuse 18 per cent, Winter Banana 40, and McIntosh 48. The Fameuse and Winter Banana trees were sprayed four times while in the McIntosh orchard the trees were sprayed five times, the first spray being based on ascospore maturity. In Vancouver island, however, the damage was not as severe as in 1929 although the losses were large. In the northern part of the Okanagan valley only one half of one per cent of the fruit were scabbed.

Man.--

Scab was reported from one locality only, near Winnipeg. Seventy-five per cent of the leaves on some trees were infected. The fruit was also scabbed.

Ont.--

Scab was slightly more prevalent than in 1929 in the Niagara peninsula although hot, dry weather checked the spread of the disease. Unsprayed orchards were severely damaged. Ascospore discharge did not take place until May 1, when it was general and well marked. The dry weather of the previous two weeks had prevented early discharge although the asci were mature.

Que.--

Severe infection of Fameuse was reported in an unsprayed orchard in Jacques Cartier county. From observations made at the Experimental Farm and the School of Agriculture, Ste. Anne de la Pocatière, the infection on the different varieties was estimated as follows: Alexander, Gano, Golden Russett and Milwaukee 5 per cent; Duchess, Greening and Melba 10 per cent; Transparent and Wealthy 15 per cent; St. Lawrence 20 per cent; Wolf River 25 per cent; Baxter and Fameuse 30 per cent; and McIntosh 65 per cent. In two orchards in Rouville and Iberville counties and in the orchard at the Experimental Farm, Lennoxville, where careful spraying has been practiced, only infections varying from a trace to slight developed on the leaves or fruit.

N.B.--

Scab was general although not as severe as in 1929. Approximately 400 trees in seven orchards, representing several varieties, showed an infection of 20 per cent. Pin point scab was observed in severe form in two orchards on Oct. 8.

N.S.--

First ascospore discharge occurred on May 15-16. The first

Apple

conidia appeared on the leaves on June 5. On June 20, well sprayed orchards showed less than one per cent of scab while unsprayed orchards showed 10 to 70 per cent. By Oct. in sprayed orchards, fruit infection varied from 0 to 20 per cent while in unsprayed orchards infection varied from 40 to 100 per cent. More scab was present in the western part of the Annapolis valley than the eastern.

P.E.I.-

This disease occurs annually in P.E.I. causing serious injury to the fruit. In all orchards with the exception of two, where careful spraying was practiced, apple scab was very destructive rendering otherwise splendid orchards useless.

FIRE BLIGHT - Bacillus amylovorus (Burr.) de Toni

B.C.-

Fire blight occurred on several varieties in the Okanagan valley, mostly, however, on Spitzenburg. One per cent of the trees of all varieties were infected. The disease was not positively identified on Vancouver island or the lower Fraser valley.

Man.-

In the orchard at the Man. Agricultural College, Winnipeg, 50 per cent of the trees were infected. The disease was also prevalent at Morden.

Ont.-

Fire blight was more prevalent this year than in 1929, particularly as a twig blight. In one orchard of crab apple trees fire blight progressed down the branches causing the death of large portions of the trees.

Que.-

Fire blight was severe in Quebec in 1930. It occurred in epidemic form in many orchards. It was particularly prevalent in four out of the eight apple growing districts of western Quebec, and it was reported from scattered localities throughout the province.

At St. Hilaire, there was a trace of both twig and blossom blight, while it was slightly more prevalent at Rougemont. In the Frelighsburg district, where there are mostly only young orchards, a trace of twig infection was generally present. In a few cases where there was an old farm orchard near the young trees, it was more severe. On Montreal island it was severe in one orchard on crab apple trees, and moderate on Fameuse, while a trace occurred on most of the other varieties. In general, it was present, mostly as twig blight, in all orchards.

Abbotsford was the most severely affected district, and the disease was mostly in the form of blossom blight. Counts in one

orchard showed 98 per cent blossom blight on Winter Arabka, 70 per cent on Wealthy, 40 per cent on Fameuse, 15 per cent on Russet, and a trace on Duchess and Yellow Transparent.

Fire blight was present in every orchard in this district, varying from a trace to severe. In one group of six Alexanders, there were 2 per cent of blossom blight and a trace of twig blight on June 26. On August 13, twig blight had become severe. In a block of Fameuse near these Alexanders there were 15-20 per cent blossom blight and a trace of twig infection, while in another block of Fameuse farther away there was only a trace of twig blight. Queen's Choice crabs, Flemish Beauty pears and one tree of Clapp's Favorite pears showed no blight on June 26, while on August 13, the crabs were severely affected with twig infection, the Flemish Beauty showed a trace, and the Clapp's Favorite pear tree was so severely affected that it subsequently died.

In the Hemmingford-Franklin district, blossom blight was general, but severe only in the vicinity of susceptible varieties of apple, such as Alexanders, or of pear. In one block of Alexanders about 30 years old there were 90 per cent blossom blight and a trace of twig infection.

Twig blight was general throughout the Chateauguy-Woodlands district, varying from moderate to severe, being severe in about 25 per cent of the orchards. Twig blight was also severe in a number of orchards at St. Joseph du Lac, but being of patchy occurrence on account of the orchards being isolated one from another. At Oka, the orchards are mostly those of the Oka Agricultural Institute, and on account of thorough pruning for blight control, only a trace occurred.

Specimens of twig blight of apple were sent in from Garthby, Wolfe county, and Mr. Perrault reported from 3 to 5 per cent blight in three orchards in Bellechasse county, and a trace in Kamouraska county. Late twig infection occurred on a few varieties of apple trees at Lennoxville (H.N. Racicot).

N.B.--

Only one tree, moderately infected, was observed in York county.

BLACK ROT - Physalospora Malorum Shear
(Sphaeropsis Malorum Berk.)

Sask.--

The greater part of one crab apple tree in the University orchard, Saskatoon, was killed by black rot, while slight infections occurred on several others.

Que.--

In one orchard, one per cent infection was reported on McIntosh in Kamouraska county.

Apple

N.B.-

Fifteen per cent of the trees at the Experimental Station, Fredericton, were severely affected with black rot.

PERENNIAL CANKER - Glceosporium perennans Zeller & Childs

A careful survey of the Okanagan valley concluded on May 31, 1930, showed the following percentages of trees affected, whether the infection was light or severe: north Okanagan 6.8 per cent, central Okanagan 21.7 per cent and south Okanagan 0.14 per cent. The number of trees in each section is practically the same.

CORKY CORE - Non-parasitic

Corky core caused heavy losses in the Okanagan valley, B.C. Fruit from affected trees are unfit for shipment. The estimated loss of fruit and the percentage of trees affected were as follows: central Okanagan 100,000 boxes, 22 per cent of the trees, south Okanagan and Similkameen 25,000 boxes, 8 per cent of the trees.

RUST - Gymnosporangium spp.

Que.-

Rust on apples was reported from Kamouraska county.

N.S.-

Very little rust was reported on apples this year. The rust was identified as Gymnosporangium germinale (Schw.) Kern.

MISCELLANEOUS DISEASES

DIE BLACK and CANKER - Cytospora sp.

Cytospora, sometimes along with Physalospora, was plentiful on dead limbs at Saskatoon, Sask. It possibly followed winter or drought injury, as the summer and autumn of 1929 were exceedingly dry.

FROST and DROUGHT INJURY - Non-parasitic

The leaves of crab apple trees were severely injured in the University orchard, Saskatoon, Sask., the leaves dying and becoming discolored from the edges inwards. The effect on the trees this season was probably slight. The injury may have been due to frost or drought, as seven degrees of frost were registered on August 31, while, on the other hand, the trees are thickly planted and the past two seasons were both dry.

In Nova Scotia the injury from frost was most pronounced.

in low sections. The tips of the leaves were browned and some of the opening buds were injured. There were 4 to 9 degrees of frost on May 11, and 1 to 5 degrees on May 14.

DROUGHT SPOT and DIE-BACK - Non-parasitic

The average estimated damage from drought spot was 5 per cent in south Okanagan and Similkameen valleys, B.C., and 8 per cent in central Okanagan. In some districts within these areas as high as 20 per cent of the trees were affected.

The damage from die back was estimated to be 6 per cent in north Okanagan, 3 per cent in central Okanagan and 2 per cent in south Okanagan and Similkameen.

FROST RING - Non-parasitic

Late spring frosts caused much injury to the fruit principally of the Wealthy variety at Kamloops, B.C., it was estimated that 5 per cent of the fruit was damaged. Frost ring was equally heavy on Joanathan at Yale, B.C.

WINTER INJURY - Non-parasitic

Most of the young trees in all varieties were badly affected in B.C. by winter injury causing 7 per cent of the young trees to be damaged.

WATER CORE - Non-parasitic

One hundred per cent of the apples were affected with water core in the Trenton variety in the Experimental Farm orchard, St. Anne de la Pocatiere and 10 to 20 per cent in St. Lawrence in two orchards in l'Islet county.

POWDERY MILDEW - Podosphaera leucotricha (Ell. & Ev.) Salm.

Powdery mildew caused no commercial damage this year in B.C., nor has it been of any importance for the last two years. Periodically however, it causes a loss of as much as 100 per cent of the crop.

Very slight damage was caused to the tips of a few twigs in Lincoln county, Ontario.

BITTER PIT - Non-parasitic

Northern Spy is most subject to this disease in B.C., although other varieties may occasionally be found affected. A loss of 10 per cent of the crop was reported this year from the Okanagan valley.

Bitter pit losses were observed in N.S. in the following

Apple

varieties: Starks, 0 to 25 per cent, a total loss in some orchards there the crop was light; Greening and Blenheim, 0 to 5 per cent; and Baldwin, a trace.

ANTHRACNOSE - Neofabraea malicorticis (Jordley) Jackson

Anthracnose was confined in the Okanagan valley, B.C., to one district in the northern section, where one per cent of the trees were affected. The disease was general on Vancouver island and in the lower Fraser valley, where the damage is always severe unless control measures are practiced. It is probably the most important disease in apple orchards on the coast.

CROWN ROT - Non-parasitic

It was estimated that 2 per cent of the trees in all varieties were affected with crown rot in southern and central Okanagan districts, B.C. In some orchards as high as 75 per cent of the trees were injured.

TWIG BLIGHT - Nectria cinnabarina (Tode) Fr.

Twig blight was quite abundant in one orchard in N.S., following picking injuries of the previous year. It was most severe on Ben Davis and Rome Beauty.

EUROPEAN CANKER - Nectria galligena Bres.

From trees observed in two orchards in York county, N.B. The disease is widespread and quite serious in old orchards.

INTERNAL BREAKDOWN - Non-parasitic

This disease was found mostly in Jonathan and Grimes Golden varieties at Okanagan, B.C., causing about 5 per cent damage in the stored crop.

SOOTY BLOTCH - Gloeodes pomigena (Schw.) Colby

In unsprayed orchards in Kings county, N.S., 40 per cent of the fruit was affected, while in regularly sprayed orchards infections varied from a trace to 2 per cent. The damage was slight.

FLY SPECK - Leptothyrium Pomi (Mont. & Fr.) Sacc.

In Kings county, N.S. as much as 90 per cent of the fruit was affected with fly speck on unsprayed trees of the Wellington variety, while 0 to 5 per cent was marked on sprayed trees.

ARMILLARIA ROOT ROT - *Armillaria mellea* Fr.

A block of about 20 trees consisting of McIntosh, Delicious, Winesap and Winter Banana were attacked by *Armillaria* in a nursery at West Vancouver, B.C., but the trees were apparently not seriously injured. *Armillaria* is not common in B.C. and this is the first case of nursery infection recorded.

PINK ROT - *Tricothecium roseum* Link

Pink rot is an important disease in P.E.I., causing the decay of stored apples as the fruit are commonly affected with scab and are therefore susceptible to the rot.

CRINKLE CORK - Non-parasitic

Several specimens were found in one orchard in Kings county, N.S. It appears to be similar to Brooks and Fisher's "York Spot" or "Hollow Apple". This disease is apparently caused by drought.

APRICOT

DROUGHT SPOT

Drought spot caused a loss of 1.5 per cent of the crop in all varieties of apricot in the southern Okanagan valley, B.C.

BLACKBERRY

ORANGE RUST - *Gymnoconia Peckiana* (Howe) Trotter

B.C.-

Orange rust occurred locally on Vancouver island and the lower Fraser valley.

Ont.-

In a plantation in Lincoln county a trace of rust was found on May 27. The rust pustules were forming, but none were yet open.

N.B.-

A single specimen was sent to the Laboratory from Kings county.

N.S.-

Orange rust was very prevalent on wild blackberries, clumps having as many as 60 per cent of their shoots affected.

CANE BLIGHT - *Leptosphaeria Coniothyrium* (Fuck.) Sacc.
(*Coniothyrium Fuckelii* Sacc.)

Cane blight was general on Vancouver island and in the lower Fraser valley. The damage, however, was insignificant.

BLUEBERRY

WITCHES' BROOM - Calyptospora columnaris (Alb. & Schw.) Kuhn.

This disease was found on cultivated blueberries in Kings county, N.S.

CHERRY

SHOT HOLE - Coccoomyces hiemalis Higgins
(Cylindrosporium hiemalis Higgins)

B.C.- Shot hole occurs sporadically, causing much defoliation in the southern Okanagan section.

Ont.- Shot hole was of no importance on cherries this year.

N.B.- Only one specimen was obtained in York county.

N.S.- There was not as much defoliation in 1930 as there was in 1929, although the disease was moderately abundant in Kings and Annapolis counties. Where the trees were sprayed the disease was well controlled.

P.E.I.- The disease infected 80 per cent of the leaves causing severe defoliation in Queens county.

POWDERY MILDEW - Podosphaera Oxyacanthae (Fr.) de Bary

Powdery mildew was severe on sand cherries in small areas of the University orchard, Saskatoon, Sask.

BROWN ROT - Sclerotinia americana (Worm.) Nort. & Ezekiel

B.C.- Brown rot was very destructive on Vancouver island and the lower Fraser valley. On Vancouver island as high as 80 per cent of the fruit was infected in some orchards.

Ont.- The first recorded appearance of the disease on the fruit was made on June 28. The infection was light.

BLOSSOM BLIGHT - Sclerotinia cinerea Schroet.

Significant damage resulted from blossom blight on

Vancouver island. This disease was also present on prunes.

ARMILLARIA ROOT ROT - Armillaria mellea Fr.

In a block of 5 year old Byngs at Kootenay Lake, B.C. nearly every tree was affected with Armillaria root rot and the affected trees were either dead or dying. The trees had been planted less than a year after the land had been cleared of bush, which had consisted chiefly of deciduous trees - aspen, birch and alder. The disease has been observed before in the past few years, but only an occasional older tree has been killed.

CORYNEUM BLIGHT - Coryneum Beijerinckii Oud.

Coryneum blight was severe on sand cherries in the University orchard, Saskatoon, Sask.

DROUGHT SPOT - Non-parasitic

Drought spot caused only very slight damage on all varieties in the southern Okanagan valley, B.C.

BARK INJURY - Cause undetermined

A Cladosporium was present in the epidermis, but not the deeper tissues of several cherry twigs sent to the Laboratory from Winona, Ont. Isolations were made from the twigs, but inoculations were not carried out. (R. S. Willison)

BLACK KNOT - Dibotryon morbosum (Schw.) Theiss. & Syd.

Black knot was moderate to severe on wild cherries in Queens county, P.E.I. Many young trees are destroyed each year by this disease, which is widespread over the province.

CRANBERRY

RED LEAF - Exobasidium Vaccinii (Fuck.) Woron.

This disease was found on wild cranberry in Digby county, N.S. causing red tips on the shoots.

CURRENT

WHITE PINE BLISTER RUST - Cronartium ribicola Fischer

B.C.-

White pine blister rust was general in the lower Fraser valley. Black currants were frequently severely affected.

Ont.-

Considerable rust was present on black currants 2 to 3 miles from the nearest known pine infections near Guelph, Ontario. In Carleton county, rust could be found on susceptible wild Ribes wherever it was looked for.

Que.-

Rust was first observed at Hull, Que., on both black and red currants on June 5. A part of the primary pustules were still unbroken. The bushes were in a garden about 250 yards from an infected pine hedge. The source of infection was probably much closer as the garden was in the shadow of a small grove of mature white pines. From the ground no rust was visible on these trees. White pine blister rust was present everywhere in the Gatineau district on wild Ribes. Susceptible species were invariably rusted.

In Laval county a patch of cultivated black currants were completely rusted and almost totally defoliated. These bushes had produced no crop for several years.

N.B.-

White pine blister rust was widespread throughout the province on both cultivated and wild Ribes. On the Experimental Farm, Fredericton, red and black currants were heavily rusted, especially the latter species.

N.S.-

All the leaves of black currants were infected in a small garden in Colchester county.

P.E.I.-

A light infection occurred late in Queens county. The damage was nil.

SEPTORIA LEAF SPOT - Mycosphaerella Grossulariae (Fr.) Lindau
(Septoria Ribes Desm.)

Ont.-

This disease was common and caused early defoliation of unsprayed bushes in southern Ontario.

N.B.-

A moderate infection of Septoria leaf spot was observed on the Experimental Farm, Fredericton.

P.E.I.-

A light infection was reported in Queens county.

GLOEOSPORIUM LEAF SPOT - Pseudopeziza Ribis Aleb.
Gloeosporium Ribis (Lib.) Mont.

A slight infection was observed in a small garden plantation in Colchester county, N.S.

POWDERY MILDEW - Sphaerotheca mors-uvae (Schw.) Berk.

B.C.-

Powdery mildew was general on Vancouver island and in the lower Fraser valley. Losses were very heavy in many localities.

Alta.-

The disease was common and frequently severe. It was reported from Edmonton, Lethbridge, Olds, Red Deer and Lacombe.

Sask.-

Powdery mildew was troublesome on black currants at Hillside.

TWIG CANKER - Nectria cinnabarina (Tode) Fr.

Twig blight was not common at the Experimental Farm, Kentville, N.S. However, black currants are not grown extensively.

GOOSEBERRY

WHITE PINE BLISTER RUST - Cronartium ribicola Fischer

Ont.-

Wild gooseberries were found rusted in Carleton and Leeds counties. On the leaves borne on the old wood the individual infections were usually small, but on the new shoots they were numerous and large, frequently involving half the leaf surface of the large vigorous leaves.

Que.-

Rust was reported from Rouville and Kamouraska counties and the Quebec district. The leaves were covered with rust.

N.B.-

Rust was widespread on cultivated and wild gooseberries on the Experimental Farm, Fredericton; 75 per cent of the leaves were heavily infected.

Gooseberry

GLOEOSPORIUM LEAF SPOT - Pseudopeziza Ribis Kleb.
(Gloeosporium Ribis (Lib.) Mont. & Desm.)

Traces of this leaf spot were observed in Queens county,
P.E.I.

SEPTORIA LEAF SPOT - Mycosphaerella Grossulariae (Fr.) Lindau
(Septoria Ribis Desm.)

Septoria leaf spot caused some defoliation at Edmonton and Lethbridge, Alta. Although this disease was not generally important this year in Nova Scotia, a rather severe infection occurred soon after harvest time in one patch in Kings county.

POWDERY MILDEW - Sphaerotheca mors-uvae (Schw.) Berk.

Powdery mildew was severe, causing a loss of 75 per cent of the crop at the Experimental Station, Summerland, B.C.

It was also reported as common and often severe in Alberta.

GRAPE

DEAD ARM - Cryptosporella viticola Shear
(Fusicoccum viticolum Redd.)

Dead arm was about as prevalent in 1930 as in 1929, in the Niagara peninsula, Ontario. The leaf symptoms of the disease were very marked this spring. In one vineyard in Lincoln county, 25 per cent of the vines were infected. The affected arms were dying.

BLACK ROT - Guignardia Bidwellii (Ell.) Viola & Ravaz.

A trace was found on the leaves of Campbell's Early in Lincoln county, Ont.

CHLOROSIS - Non-parasitic

Chlorosis was reported in Lincoln county, Ont. The grapes colored prematurely, did not size well and the leaves turned yellow. The disease was confined to the Worden variety.

PEACH

SCAB - Cladosporium carpophilum Thüm

Scab was very prevalent in the Niagara peninsula, Ont. on early varieties such as Rochester, St. John and Greensboro; later varieties were very free. On Aug. 12, in an orchard, in Lincoln county 60-65 per cent of the fruit were scabbed while Elberta was free from infection.

LEAF CURL - Taphrina deformans (Berk.) Tul.

Leaf curl was general and severe on Vancouver island, B.C. The disease was rare this season in the Niagara peninsula, Ont. Infections were scattered and appeared late in the season. On the other hand leaf curl was unusually prevalent and severe in 1929.

WILT - Verticillium spp.

Verticillium wilt caused partial defoliation of several trees in a 4 year old orchard at the Laboratory of Plant Pathology, St. Catharines, Ont. In a 3 year old orchard of Elbertain Lincoln county 10 per cent of the trees were affected, the infection showing on one side or one limb of the diseased trees. The resulting defoliation of the affected limbs stimulated the affected twigs to produce new buds.

POWDERY MILDEW - Sphaerotheca pannosa (Wallr.) Lév.
var. Persicae Woron.

Traces of powdery mildew were found on all varieties in southern Okanagan valley, B.C.

BROWN ROT - Sclerotinia americana (Worm.) Nort. & Ezekiel

B.C.-

Brown rot was reported from Vancouver island and the lower Fraser valley. Infection was severe at the Experimental Station, Saanichton.

Ont.-

From observations made in the old orchard of the Laboratory farm, St. Catharines, it was found that a large number of incipient cankers were present on the smaller fruit-bearing twigs. These cankers originated from the pedicels that bore rotted fruit in 1929. In many cankers the disease had spread down the smaller laterals girdling and killing the larger branches. (R. S. Willison) For 1930 apothecia were first observed on May 16, in Lincoln county. Brown rot was of no importance in 1930 either as a blossom blight or as a fruit rot.

CANKER - Cytospora spp.

In 1929 in a 3 year old orchard at the Laboratory farm, St. Catharines, Ont. containing 330 trees, one wound was marked on each tree for further observation. Of the 330 wounds, 234 were due to pruning, 84 due to mechanical injury and 12 due to other causes, chiefly winter injury. In the summer of 1930 when these wounds were examined it was found that 36 or about 9 per

Peach

cent had developed cankers due to Cytospora sp., as far as known. Of the pruning wounds not healed in the fall of 1929, 13 per cent became cankered, of those caused by mechanical injury 5 per cent were cankered and of wounds from other causes 15 per cent produced cankers. The estimated damage was 10 per cent. (R. S. Willison)

PEAR

FIRE BLIGHT - Bacillus amylovorus (Burr.) de Toni

B.C.--

Fire blight occurred chiefly on Barletts, although it was observed on all varieties in the Okanagan valley, B.C. Ten per cent of the trees were injured.

Ont.--

Fire blight was general and severe this year being more prevalent than usual particularly as a twig blight. In one orchard of Barletts in Lincoln county, 25 per cent of the twigs were killed by fire blight and in another orchard the trunk of one tree in a block of 50 was half girdled.

Que.--

Although there was a slight amount of fire blight on pear in 1929 none was found on the several varieties examined in Rouville county by June 26. However, by this date the disease had appeared on apple. (See discussion of fire blight on apple).

SCAB - Venturia pyrina Aderh.

B.C.--

Scab was general on Vancouver island and in the lower Fraser valley. Losses were severe, unless control measures were practiced.

Ont.--

The appearance of conidia on twig lesions was first recorded on May 21, on badly cankered twigs of Flemish Beauty in Lincoln county.

Que.--

In one orchard in Rouville county, 40 per cent of the leaves of Clapp's Favorite were infected, with an average of 2 infections per leaf on June 26. A few leaves were nearly covered and already turning yellow. The subsequent damage was probably considerable.

P.E.I.--

One hundred per cent of the fruit of Flemish Beauty was infected, rendering the fruit useless.

DROUGHT SPOT - Non-parasitic

An average loss of 6 per cent of the fruit in all varieties was caused by drought spot in the southern and central Okanagan districts, B.C.

BLOSSOM END ROT - Non-parasitic

This disease occurs mostly on trees set out about 10 years ago in the southern Okanagan district.

POWDERY MILDEW - Podosphaera leucotricha (Ell. & Ev.) Salm.

Three per cent of the fruit of all varieties were damaged in the southern Okanagan valley, B.C.

ANTHRACNOSE - Neofabraea malicorticis (Cordley) Jackson

Anthracnose was general on Vancouver island and in the lower Fraser valley, B.C. Losses were severe unless control measures were practiced.

PLUM

BLACK KNOT - Dibotryon morbosum (Schw.) Theiss. & Syd.

Ont.-

Black knot was slightly more prevalent this year especially in neglected orchards, where it has become very destructive. Reine Claude has proven to be very susceptible.

Que.-

In one orchard of 75 trees in Laval county, 100 per cent of the branches were severely damaged. No fruit has been produced and the trees will ultimately be killed. It was claimed that the infection was worse this season although all the knots were cut out last year.

N.B.-

A slight infection was observed on one tree in the Experimental Farm orchard, at Fredericton.

N.S.-

Damage ranging from 3 to 10 per cent was reported on susceptible varieties from Kings county.

Plum

FIRE BLIGHT - Sacillus amylovorus (Burr.) de Toni

Fire blight was reported on plums from Port Haney, B.C. and Stanstead county, Que.

PLUM POCKETS - Exoascus Pruni Fuck.

All the trees in the Agricultural College orchard, Winnipeg, Man. were infected with plum pockets. Although most of the trees had only a small percentage of the fruit diseased, some had as high as 90 per cent destroyed. This disease was also present at Morden, Man.

SILVER LEAF - Stereum purpureum Fr.

Only 3 or 4 trees attacked by silver leaf were observed this year in Kings county, N.S.

BROWN ROT - Sclerotinia americana (Worm.) Mort. & Ezekiel

Brown rot was general on Vancouver island and in the lower Fraser valley, B.C. This disease was also present on prune.

Thirty-five per cent of the fruit were destroyed by brown rot in a garden containing 6 trees at Aylmer, Que.

SHOT HOLE - Coccomyces prunophorae Higgins
(Cylindrosporium prunophorae Higgins)

Shot hole was heavy at Winnipeg, Man. On some trees 100 per cent of the leaves were severely affected.

Shot hole caused considerable defoliation of German Prune and Magnum Bonum in Queens county, P.E.I. Ninety per cent of the leaves were infected.

DROUGHT SPOT - Non-parasitic

Ten per cent of the crop, which is not large, was affected with drought spot in the southern Okanagan district, B.C.

RASPBERRY

SPUR BLIGHT - Didymella applanata (Niessl) Sacc.

Alta.-

A light infection of spur blight was reported from Edmonton

and Lethbridge, Alberta.

Man.-

At the Experimental Farm, Morden a 50 per cent infection was observed on Latham, Hubert and Viking varieties. The disease is also present, to a small extent, throughout that district.

Que.-

Only traces of spur blight were found in 6 plantings of Newman and one of Viking, in Rouville and Nicolet counties, while 3 plantings of Herbert in St. Maurice and Rouville counties were moderately to heavily infected. In the more severe infections all the canes were discolored for 2 to 2½ feet from the ground. The disease was more severe in the older plantations.

N.S.-

Spur blight was in general less severe this year than in 1929, especially in young plantations, which were practically free from disease. In old patches of Herbert in Kings, Annapolis and Digby counties up to 60 per cent of the canes were slightly infected.

P.E.I.-

Spur blight is an important disease in this province. Viking seems least susceptible.

MOSAIC AND LEAF CURL - Virus Diseases

B.C.-

Five per cent of the plants were affected with mosaic in the Okanagan valley.

Alta.-

Mosaic caused moderate damage in the University gardens, Edmonton.

Ont.-

Mosaic affected 100 per cent of the plants in several plantations at Collingwood. Leaf curl and mosaic were general in a plantation in Lincoln county.

Que.-

Infections varying from a trace to 4 per cent were reported from 12 plantations of Newman scattered in several counties. The disease was worse in old plantations. Herbert was free from mosaic. In one plantation it was growing next to diseased Newman. Two per cent of the plants of Viking were affected in one planting. A single plant of Newman affected with leaf curl was found in one plantation in Rouville county.

Raspberry

N.B.-

Thirty per cent of the plants were affected with mosaic in the Experimental Station plantation at Fredericton, while leaf curl was observed on 3 per cent of the plants.

N.S.-

In Kings county no mosaic was observed on Herberts and only 3 per cent of the Viking plants were affected. Roguing has kept the disease well in check in young plantations. Mosaic affected 75 per cent of the plants of an unknown variety in a planting in Colchester county.

P.E.I.-

Mosaic was responsible for the destruction of many promising plantations. Viking was practically free.

ANTHRACNOSE - Plectodiscella veneta Burkh.
(Gloeosporium venetum Speg.)

Anthracnose was general on Vancouver Island and in the lower Fraser valley, B.C. causing significant damage.

In Joliette and Nicolet counties, Que., a trace of anthracnose was observed on Newman raspberries, while in Yamaska, L'Assomption, Rouville, Iberville and Quebec counties infections ranging from 50 to 100 per cent were reported on the same variety. In Iberville county Herbert raspberries growing next to diseased Newmans were free from anthracnose. In heavy infections as much as 10 per cent of the new shoots had their tips killed by the disease, stunting their growth. Vikings showed a trace in Rouville county.

Anthracnose was severe on the upper third of the canes, causing a die back on the fruiting canes, in Digby county, N.S.

SEPTORIA LEAF SPOT - Mycosphaerella Rubi Roark
(Septoria Rubi West.)

One hundred per cent of the leaves were infected on Herbert raspberries in Hull, Rouville and St. Maurice counties, Que. Infection caused premature defoliation, but as it did not take place until late in the season the damage was usually slight.

Sixty per cent of the leaves were infected, causing severe defoliation in Digby county, N.S. Leaf spot is not prevalent in a young thrifty patch adjoining the infected section.

CANE BLIGHT - Leptosphaeria Coniothyrium (Fuck.) Sacc.

Cane blight was general on Vancouver island and in the lower

Raspberry

Fraser valley, B.C. causing significant damage.

Only two specimens of cane blight were found on the Experimental Station plantation at Fredericton, N.B.

In a plantation of Herbert in Digby county, N.S. the plants that were sprayed in 1929 and pruned early showed infections varying from 0 to 25 per cent, while 75 per cent of the canes were affected in the unsprayed sections.

BLUE STEM WILT - Verticillium ovatum Berkeley & Jackson

This disease was more prevalent than usual in Ontario, especially on Viking variety, infection ranging from 2 to 10 per cent.

MISCELLANEOUS DISEASES

KUEHNEOLA RUST - Kuehneola uredinis (Lk.) Arth.

Rust attacked 40 per cent of the leaves in a plantation of Viking in Kings county, N.S. causing the leaves to dry up. Infections were also found on late fruit.

POWDERY MILDEW - Sphaerotheca Humuli (DC.) Burr.

Raspberry mildew was abundant on certain varieties at Edmonton, Alberta.

PHRAGMIDIUM RUST - Phragmidium imitans Arth.

Infection from rust was general and the damage was significant on Vancouver island and in the lower Fraser valley, B.C.

CROWN GALL - Pseudomonas tumefaciens (E.F. Sm. & Towns.) Dugg.

General on Vancouver island and in the lower Fraser valley, B.C. causing insignificant damage.

BACTERIAL FLOWER BLIGHT

A flower blight caused by bacteria, was general on Vancouver Island and the lower Fraser valley. The organism appears to be an undescribed species (W. R. Foster).

STRAWBERRY

LEAF SPOT - Mycosphaerella Fragariae (Schw.) Lindau (Ramularia Tulasnei Sacc.)

Sask.-

A heavy infection of this leaf spot was reported from St. Gregor.

Man.-

The only report of leaf spot in Manitoba was from a field near

Strawberry

Winnipeg, where 75 per cent of the plants were infected.

Ont.-

A heavy infection of leaf spot was reported from Lincoln county.

Que.-

Heavy infections of 60 to 100 per cent were reported on several varieties of strawberries from Quebec, L'Assomption and Terrebonne counties.

N.B.-

Leaf spot of strawberry was widespread and quite important in New Brunswick. A moderate infection was reported from the Experimental Station, Fredericton.

P.E.I.-

This disease was not common this year and therefore of no importance.

POWDERY MILDEW - Sphaerotheca Humuli (DC.) Burr.

Powdery mildew was first observed in a planting in Lincoln county, Ont. on June 3. At this date the damage was slight. In another planting observed June 14, the plants were heavily infected. Bordeaux dust had failed to check the disease and the foliage was burned up and crisp. The dust may have possibly accentuated the burning.

BLACK ROOT - Cause undertermined

Twenty to forty per cent of the plants were affected with black root in two plantings of Premier, in Lincoln county. The disease was especially noticeable on young suckering plants. Many of the affected plants were dead.

GRAY MOULD - Botrytis cinerea Pers.

Gray mould was present on Vancouver island, B.C.

Botrytis was usually found associated with a destructive rot of strawberries in P.E.I.

MOSAIC - Virus

Seventy-five per cent of the plants were affected with mosaic in a planting of Premier in Lincoln. This is the first time this disease has been noticed on Premier. The plants were turning yellow and dying.

Strawberry

CROWN ROT - Corticium Solani (Prill. & Del.) Bourd. & Galz.

Crown rot was found occasionally on Vancouver Island, B.C.
causing slight damage.

DISEASES OF FOREST AND SHADE TREES

ASH (Fraxinus)

LEAF SPOT - Gloeosporium irregulare Peck

One tree was severely affected in Yarmouth county, N.S.

BALSAM FIR (Abies balsamea)

WITCHES' BROOM - Melampsorella elatina (Alb. & Schw.) Arth.

This disease was widespread in York county, N.B., although the rate of infection in about 1000 trees only averaged about one per cent.

BEECH (Fagus)

SEEDLING BLIGHT - Botrytis sp.

Very young beech seedlings are destroyed each year by Botrytis in P.E.I.

CANKER - Nectria sp.

This disease is abundant in some blocks of trees at the Experimental Station, Kentville, N.S. (K. A. Harrison)

ROT - Panus stypticus Fr.

This rot is very common in N.S. on beech trees dying from coccus attack.

BIRCH (Betula)

ARMILLARIA ROT - Armillaria mellea Fr.

Two trees attacked by Armillaria were observed in Kings county, N.S.

HEART ROT - Fomes fomentarius Fr.

This disease is very common in P.E.I., killing many trees both young and old.

BUTTERNUT (Juglans)

LEAF SPOT - Marssonnia Juglandis (Lib.) Sacc.

Slight to severe infections causing premature defoliation were observed in Hull, l'Assomption and Argenteuil counties, Que. The disease was also observed along the St. Lawrence between Montreal and Quebec, between St. Francois du Lac and Sherbrooke and also between Sherbrooke and Abbotsford.

A moderate infection was reported on seven trees along the roadside in the St. John valley, N.B.

ELM (Ulmus)

BLACK SPOT - Gnomonia ulmea (Schw.) Thüm.

A trace was observed in York county, N.B.

ENGLISH WALNUT (Juglans regia)

BACTERIAL BLIGHT - Pseudomonas Juglandis Pierce

This disease is general on Vancouver island, B.C., and causes severe damage on the Experimental Farm, Saanichton.

HAWTHORN (Crataegus)

RUSTS - Gymnosporangium spp.

G. Betheli Kern is quite common on Vancouver island, B.C., on native hawthorns.

Moderate injury to the leaves and flower clusters due to G. clavariaeforme (Jacq.) DC. was observed at the Experimental Farm, Charlottetown, P.E.I. This rust only attacked the grafted variety, C. Oxyacantha var rosea, the stock being immune.

FIRE BLIGHT - Bacillus amylovorus (Burr.) Trev.

C. Oxyacantha var rosea grafted on a hardy stock contracted fire blight from an affected apple tree nearby in P.E.I. (H. T. Güssow)

HEMLOCK (Tsuga)

ARMILIARIA ROT - Armillaria mellea Fr.

Sporophores of this fungus may frequently be found on stumps or partly dead trees in Kings county, N.S.

HORSECHESTNUT (Aesculus)

LEAF SPOT - Phyllosticta sphaeropsoides Ell. & Ev.

This disease was very prevalent in the western part of N.S., and was especially severe along the coast in Shelbourne and Queens counties.

Moderate to heavy infection was reported from Queens county, P.E.I., causing heavy defoliation although the trees do not seem to suffer in consequence.

JUNIPER (Juniperus)

RUST - Gymnosporangium sp.

This disease is common and readily found in Lincoln county, Ont.

MAPLE (Acer)

TAR SPOT - Rhytisma acerinum Fr.

A trace of tar spot was observed in York county, N.B. Infections were heavy and the damage general on all species of maples except Acer plantinoides in P.E.I.

WILT - Verticillium sp.

Wilt affected 5 per cent of the trees causing defoliation of those diseased in a nursery plantation of young Norway maples in Lincoln county, Ontario.

This disease appears to be on the decrease in N.B. In 1928 and 1929, wilt was widespread and quite serious, but in 1930 only a slight infection was observed on 4 trees out of 40 inspected in the city of Fredericton.

LEAF SPOT - Phyllosticta acericola Cke. & Ell.

This disease is not serious in N.S. but causes unsightly spots on the foliage of Acer spicatum.

A heavy infection was observed on one sugar maple (A. saccharum) in P.E.I. The yellowing of the leaves on this tree was apparently due to the severe attack.

FROST INJURY - Non-parasitic

All the trees were injured by frost on the Experimental Farm and in the village of Ste. Anne de la Pocatière, Que.

HEART ROT - Fomes fomentarius (L.) Fr.

Specimens were easily found in Kings county, N.S., although the disease was not common.

MOUNTAIN ASH (Sorbus)

RUST - Gymnosporangium cornutum (Pers.) Arth.

Only one specimen was collected in York county, N.B.

OAK (Quercus)

LEAF BLIGHT - Gloeosporium nervisequum (Fuck.) Sacc.

A severe infection of Gloeosporium was observed on some native oaks (Q. macrocarpa) near Kingston, Ont. Of the different species of Gloeosporium on oak the fungus seem to answer best the

description of G. nervisequum.

HEART ROT - Polyporus sulphureus (Bul.) Fr.

This disease was reported on red oak (Q. rubra) in Kings county, N.S., but as oaks are not common, the disease is rare.

PINE (Pinus)

WHITE PINE BLISTER RUST - Cronartium ribicola Fisch.

Ont.-

In a plantation of pines imported from Germany and planted in 1907, white pine blister rust is still present despite the fact that the cutting out of diseased trees every year has been practiced since 1914. In Lincoln county the aecial stage was reported as being very conspicuous in a block of white pine. Some badly affected trees were also reported from two miles east of Oakville.

Que.-

A severe infection killing about one tenth of the branches was reported from Laval county. These trees are very close to a garden where black currants are growing and are very heavily infected. Two trees were found infected just outside Hull in a young hedge recently transplanted from a nearby wood lot. A single specimen was also observed at Kazubazua. In addition, specimens were sent in from Sixteen Island lake and Montebello, although no information was received as to the extent of the infections.

N.B.-

One specimen was forwarded to the Laboratory from Restigouche county. The disease, however, occurs in scattered areas, but causes only slight damage.

N.S.-

Aecia were reported as abundant at Kentville.

P.E.I.-

Heavy damage was reported from Queens and Prince counties. Blister rust is destroying the few remaining white pines in the province.

BLISTER RUST - Cronartium Comptoniae Arth.

Two specimens found within a few days of each other were observed on Pinus Mugo in a nursery at Sussex, N.B. This is the first time that this disease has been found on imported stock in this province.

WOOD GATE RUST - Peridermium sp.

A few scotch pines (P. sylvestris) on the Ontario Agri-

Pine

cultural College farm are infected with what is apparently this rust. Some galls on the limbs are at least 20 years old.

NEEDLE RUST - Coleosporium Solidaginis (Schw.) Thüm.

Specimens of this rust were sent in from Three Hills, Alberta.

POPLAR (Populus)

LEAF SPOT - Septoria spp.

Leaves of suckers of P. balsamifera were moderately affected at Beaver Creek (R. C. Russell). Leaves of Populus sp. sent in from Rosthern were found affected with Septoria musiva Peck (T. C. Vanterpool.)

INK SPOT - Sclerotinia bifrons Seaver (Sclerotium bifrons Ell. & Ev.) Only a trace was reported from Rouville and Compton counties, Que.

CYTOSPORA CANCKER - Cytospora chrysosperma (Pers.) Fr.

Out of 36 plantations of Russian poplars examined in Alta., 20 were severely damaged, while the others showed a trace to medium damage. Severe damage was observed in the areas around North, East and South Calgary. This disease seems to follow weakening due to the rigours of the climate, such as drought.

Numerous young Russian poplars were partially or entirely killed in the University orchard at Saskatoon, Sask., and the dead limbs were covered with pycnidia.

ROSELLINIA CANCKER - Rosellinia pulveracea (Ehrek.) Fuck.

The main trunk of a young, seven foot poplar was killed by this disease. The cankers bore some resemblance to those caused by Hypoxyton pruinatum (Klotzsch) Cke. The fungus was identified by Dr. Dearness.

HYPOXYLON CANCKER - Hypoxyton pruinatum (Klotzsch) Cke.

One medium-sized tree of P. tremuloides was being killed by the roadside at Buchanan, Sask. The perithecia contained mature asci. This fungus appears to be killing many scattered trees in the groves in Sask.

FROST INJURY - Non-parasitic

A considerable number of the leaves on P. tremuloides were killed and blackened by frosts in the groves on the higher hills near Dana and Carmel, Sask.

DIE BACK - Fusicladium radiosum (Lib.) Lind

This disease was observed at Sutherland, Sask., on P. tremuloides. It is very destructive to the tender branch tips and sometimes whole groves are attacked.

SPRUCE (Picea)

NEEDLE RUST - Melampsoropsis ledicola (Pk.) Arth.

Sask.-

Severe damage was reported from the Prince Albert National Park.

Que.-

Heavy infections were reported from Lac Brule.

N.S.-

Fifty per cent of the needles were infected on blue spruce in Lunenburg county and some trees of white and red spruce were defoliated in Shelburne and Yarmouth counties.

P.E.I.-

A general infection, causing evident injury, was observed on blue spruce at the Experimental Station, Charlottetown.

WILLOW (Salix)

SCAB - Fusicladium saliciperdu (All. & Tub.) Tub.

A heavy infection of scab causing severe damage was reported from Garthy township, Que.

The average infection throughout N.B. amounted to about 65 per cent. Trees attacked three years ago succumbed this season, although a few trees are still alive that were attacked four years ago.

Five to eighty per cent of the twigs were affected in Kings county, N.S.

RUST - Melampsora Bigelowii Thum.

At St. Gregor, Sask., the infection was fairly heavy, but not widespread.

A trace was observed in York county, N.B. This disease occurs only rarely in P.E.I.

TAR SPOT - Rhytisma Salicinum Fr.

A heavy infection was reported on a few bushes at Birch Hills, Sask.

CYTOSPORA CANCKER - Cytospora chrysosperma (Pers.) Fr.

This disease was plentiful on dead limbs of cultivated trees (S. laurifolia) in windbreaks around the University at Saskatoon, Sask.

A Cytospora sp. causing "twig die-back" occurs occasionally in Kings county, N.S.

Willow

LEAF SPOT - Gloeosporium Salicis West.

Fairly heavy defoliation was reported from Kings county,
N.S.

BLIGHT - Physalospora Miyabeana Fukushi

This blight caused local and slight damage in Kings county,
N.S.

DISEASES OF ORNAIENTALS

BEGONIA

GRAY MOULD - Botrytis cinerea Pers.

Two Rex begonia were affected at the Experimental Station, Fredericton, N.B.

BARBERRY (Berberis)

RUST - Uromyxis sanguinea (Peck.) Arth.

General on Vancouver island, B.C.

STEM RUST - Puccinia graminis Pers.

Stem rust was collected in York county, N.B. and Eganville, Ont.

CARAGANA

LEAF SPOT - Septoria Caraganae (Jacz.) P. Henn.

A moderate infection was reported on some hedges around Saskatoon, Sask. The disease causes defoliation. It was not as severe as in 1928 when it was first observed by Prof. Fraser.

CARNATION (Dianthus Caryophyllus)

RUST - Uromyces Dianthi (Pers.) Niessl

General but slight infections were reported from B.C.

Rust was severe in a greenhouse at Edmonton, Alta.

The carnations in the Horticultural greenhouses, Experimental Farm, Ottawa, Ont., were severely infected.

A trace of rust was observed on carnations brought into the greenhouse at Aylmer, Que.

LEAF SPOT - Alternaria Dianthi Stev. & Hall

A moderate infection was observed in the greenhouse at Fredericton, N.B. This disease is causing considerable damage throughout the province.

CENTAUREA

POWDERY MILDEW - Erysiphe Cichoracearum DC.

A heavy infection was reported from Lincoln county, Ont.

CHINA ASTER (Callistephus)

YELLOWS - Virus

Sask.-

About 3 per cent of the plants in a bed on the University campus at Saskatoon, Sask., were noticeably diseased.

Ont.-

Aster yellows was prevalent in Lincoln county, causing a yellowing of the plants and a blasting of the blooms.

N.B.-

Severe infection was reported from York county. This disease is widespread and is the most destructive malady of asters occurring in the province.

A disease similar to aster yellows was also found on the following plants, which Kunkel reported subject to yellows: Calendula, Tragopogon, Taraxacum, Lactuca, Erigeron, Tagetes, Gaillardia, Dimorphotheca, Helichrysum, Plantago and Chrysanthymum.

In addition the disease was observed on the following plants, which Kunkel did not report: Helianthus, Rudbeckia, Zinnia, Dahlia, Conopsis, Lavatera, Ageratum, Leontodon, Spergula, Apium and Antirrhinum (D. MacLeod). (See also under Plantago major in the Miscellaneous Section).

WILT - Fusarium conglutinans Woll. var
Callistephi Beach

B.C.-

All varieties of asters were infected at Summerland, B.C., causing slight damage. Wilt was also common on Vancouver island.

Sask.-

Wilt was reported as severe at Caderre.

Que.-

Wilt was reported in one garden only in Kamouraska county, where 75 per cent of the plants were infected.

N.B.-

Severe infections were reported in numerous gardens throughout the province. No common varieties are immune to this disease, which has become a serious factor in the production of asters during the past two seasons.

STEM BLIGHT - Botrytis sp.

Stem blight was serious on the Experimental Farm, Saanichton B.C.

In Lincoln county, Ont., a wilt caused by Botrytis affected 5 per cent of the plants.

STEM ROT - Corticium Solani (Prill. & Del.) Bourd. & Galz.

Stem rot was occasionally found on Vancouver island, B.C.

RUST - Coleosporium Solidaginis (Schw.) Thüm.

A moderate infection was reported at the Experimental Station, Fredericton, N.B.

CHRYSANTHEMUM

POWDERY MILDEW - Erysiphe Cichoracearum DC.

General and quite severe in greenhouses in B.C. It also occurred this year in the field.

YELLOWS - Virus

Severe infections were observed in York county, N.B.

DAHLIA

YELLOWS - Virus

Severe infection was reported from York county, N.B.

BUD ROT - Botrytis spp.

Bud rot was occasionally found on Vancouver island, B.C.

TUBER ROT - Bacillus sp.

This disease is widespread and causes considerable damage in fancy varieties in N.B. A severe infection was observed at the Experimental Station, Fredericton.

GLADIOLUS

SCAB - Bacterium marginatum McC.

Scab was common on Vancouver island and in the lower Fraser valley, B.C. Damage was severe in certain locations only.

MOSAIC - Virus

Plants were observed on Vancouver island, B.C., apparently affected with mosaic.

HOLLYHOCK (Althaea)

RUST - Puccinia Malvacearum Bert.

B.C.-

Rust was very serious on Vancouver island and in the lower Fraser valley, particularly after the seedling year.

N.B.-

A severe infection was reported from the Experimental Station at Fredericton.

N.S.-

This disease was general on the older plants in Hants county.

P.E.I.-

Slight to severe infection was observed throughout P.E.I. This disease is very difficult to control in this province by any known method.

LEAF SPOT - Septoria malvicola Ell. & Ev.

Septoria leaf spot was very common in Quebec county, Que., causing considerable damage.

WILT - Sclerotinia sp.

Five plants were affected at the Experimental Station, Fredericton, N.B.

HONEYSUCKLE (Lonicera)

POWDERY MILDEW - Microphaera Alni (Wallr.) Wint. var Lonicerae (Schlecht.) Salm.

Seventy-five per cent of the leaves were infected at the Experimental Farm, Ste. Anne de la Pocatière.

TWIG BLIGHT - Diplodina tatarica Allesch.

The twigs on one side of a bush were affected and apparently were being killed by this fungus at Beaverlodge, Alberta.

IRIS

LEAF SPOT - Didymellina macrospora Kleb.

B.C.-

Leaf spot was reported from Enderby and also from Vancouver island, where the damage was severe in many gardens.

Sask.-

A trace was reported on Rose Unique at Indian Head.

P.E.I.-

Leaf spot affected about 75 per cent of the leaves causing severe damage to the plants.

RHIZOME ROT - Bacillus carotovorus L.R. Jones

Rhizome rot was found occasionally in B.C.

Fifty per cent of the plants were badly diseased in two gardens in York county, N.B. This disease was widespread in 1930.

RUST - Puccinia Iridis (DC.) Rabh.

A trace was found on Iris versicolor growing wild in York county, N.B.

LARKSPUR - (Delphinium)

POWDERY MILDEW - Erysiphe Polygoni DC.

Sask.-

Fairly heavy infections on the lower leaves were reported.

N.B.-

A severe infection was observed at the Experimental Farm, Fredericton. This disease is general.

P.E.I.-

Powdery mildew was present on all the plants causing slight damage in 2 gardens in Queens county.

BACTERIAL BLIGHT - ?Pseudomonas Delphinii (E.F.Sm.) Stapp

Several severely affected plants were observed in Yarmouth and Annapolis counties, N.S.

LILAC (Syringa)

POWDERY MILDEW - Microsphaera Alni (Wallr.) Salm.

Slight damage was reported from Queens county, P.E.I.

LILY (Lilium)

BLIGHT - Botrytis cinerea Pers.

Many plants were very severely blighted or killed in Yarmouth county, N.S.

NARCISSUS

BLIGHT - Botrytis spp.

Slight damage was reported from B.C.

NEMATODES - Tylenchus dipsaci (Kühn) Bast.

General and serious in B.C.

PANSY (Viola)

POWDERY MILDEW - Sphaerotheca Humuli (DC.) Burr. var fuliginea
(Schlecht.) Salm.

Slight damage was reported from Summerland, B.C.

PEONY (Paeonia)

BLIGHT - Botrytis Paeoniae Oud.

Sask.-

Severe on peonies chiefly as root and stem rot at Moosomin. At Indian Head a slight infection of the buds caused a loss of 2 to 4 per cent of the blooms.

N.B.-

Slight infections were reported at the Experimental Station, Fredericton. The disease was not important in 1930.

N.S.-

Varieties at the Experimental Station, Kentville, showed 0 to 20 per cent of the stalks injured. This disease is general throughout the province; many urgent requests have been received from growers for control measures.

P.E.I.-

The infection is difficult to estimate. The young shoots were affected as well as flower buds. The fungus seem to overwinter and grows saprophytically upon the old dead parts of the plants.

PRIMULA

GRAY MOULD - Botrytis cinerea Pers.

Two diseased specimens were found in the Experimental Station greenhouse, at Fredericton, N.B.

ROSE (Rosa)

RUST - Phragmidium spp.

B.C.-

Rust was general on Vancouver island and in the lower Fraser

valley. The infection was severe on many varieties.

Sask.-

Rust was found at Saskatoon and Sutherland on wild roses. At Saskatoon the rust was probably Phragmidium speciosum while the Sutherland specimens were infected by a leaf inhabiting species.

Ont.-

A severe infection was reported from Lincoln county.

N.B.-

Roses were moderately infected at the Experimental Station, Fredericton.

N.S.-

Several plants in two rose gardens in Yarmouth county, showed 75 per cent of the leaves infected.

P.E.I.-

Two per cent of the leaves of Rosa odorata were infected in a garden in Queens county.

BLACK SPOT - Diplocarpon Rosae Wolf.

B.C.-

Infection was general and, on many varieties, severe.

Sask.-

A heavy infection was reported on La Reve variety in the Experimental rose plots at Saskatoon, while other varieties were hardly affected. At Indian Head, one yellow-flowered variety was severely infected while several other varieties showed no trace of black spot.

Que.-

Infection was severe on young crowded plants but only a slight amount was present on old plants in a regular bed in Chambly county. The damage was only slight, causing a retardation of growth in the young plants.

N.B.-

A moderate infection was reported from the Experimental Station at Fredericton. The disease is widespread and causes considerable damage.

LEAF SPOT - Cercospora rosaecola Pass.

Heavy infections of leaf spot were observed at St. Gregor and Beaver Creek, Sask., on native roses.

Rose

WILT - Verticillium sp.

A single plant, killed by wilt, was reported from Lincoln county, Ontario.

POWDERY MILDEW - Sphaerotheca pannosa (Wallr.) Lév.

Powdery mildew was general and on many varieties severe, on Vancouver island and in the lower Fraser valley, B.C.

A general infection causing the curling of the leaves and blasting of the blossom buds was observed in Lincoln county, Ont.

INFECTIOUS CHLOROSIS - Cause unknown

A slight localized infection was reported from the lower Fraser valley, B.C.

A slight infection was also found at the Experimental Station, Fredericton, N.B.

CANE BLIGHT - Leptosphaeria Coniothyrium Fuck.

Infection was general but the damage slight on Vancouver island and in the lower Fraser valley, B.C.

SWEET PEA (Lathyrus)

POWDERY MILDEW - Erysiphe Polygoni DC.

Slight to severe damage was reported from Queens county, P.E.I.

BUD DROP - Non-parasitic

The sweet peas were moderately affected with bud drop in 4 gardens in York county, N.B. The disease is only of local importance.

ROOT ROT - Cause undetermined

Sixty per cent of the plants were moderately affected with root rot in 14 gardens examined in York county.

ROOT BURN - Non-parasitic

The use of excessive amounts of wood ashes caused severe root burn in one garden in York county.

SNAPDRAGON (Antirrhinum)

RUST - Puccinia Antirrhini Diet. & Holw.

B.C.-

Snapdragons were heavily rusted on Vancouver island and the

lower mainland; the damage was severe.

Sask.-

A heavy infection was reported from one garden in Saskatoon.

N.B.-

In two greenhouses in Fredericton, 60 per cent of the plants were moderately infected. The disease was unusually severe this season in greenhouses.

N.S.-

Two beds at Hebron were severely infected, the infection being traced to the greenhouse.

ROT - Corticium Solani (Prill. & Del.) Bourd. & Galzin.

This rot is common on Vancouver island, B.C., but causing little damage.

TULIP

COLOUR BREAKDOWN - Virus

Five per cent of the tulips were affected at Summerland, B.C.

BLIGHT - Botrytis Tulipae (Lib.) Lind

A very serious infection was reported from the Experimental Station, Saanichton, B.C. This disease is worse some years than others.

VINCA

RUST - Puccinia Vincae

Specimens submitted from Toronto, Ont., proved to be infected with this rust.

ZINNIA

WILT - Fusarium spp.

Sixty per cent of the plants at Summerland B.C., were damaged by wilt. The disease was very bad in the plot used for breeding experiments.

DISEASES OF MISCELLANEOUS PLANTS

The information here reported on parasitic fungi was received from collaborators. Time unfortunately has not permitted the recording of the fungi collected about Ottawa this summer, as a large portion of the collections remain to be examined. All records that would duplicate last year's report are also omitted.

Agropyron cristatum J. Gaertn.

Claviceps purpurea (Fr.) Tul. Edmonton, Alta.

Agropyron dasystachyum (Hook.) Scribn.

Claviceps purpurea (Fr.) Tul. Cayley, Alta.

Agropyron repens (L.) Beauv.

Puccinia graminis Pers. Forty-five per cent of the plants were moderately rusted at the Experimental Station, Fredericton, N.B. Common this year in York county.

Claviceps purpurea (Fr.) Tul. Edmonton, Alta. Also 5 per cent of the plants moderately affected at the Experimental Station, Fredericton, N.B.

Agrostis palustris Huds.

Puccinia graminis Pers. Twenty per cent of the plants were moderately rusted at the Experimental Station, Fredericton. Wide-spread this year in York county.

Amaranthus retroflexus L.

Cystopus Bliti (Piv.) Lévl. Plants moderately affected at the Experimental Station, Fredericton, N.B.

Amelanchier alnifolia Nutt.

Apiosporina Collinsii (Schw.) v. Höhnelt. Saskatoon, Sask.

Anemone cylindrica A. Gray

Puccinia Clematidis (DC.) Lagerh. Sutherland, Sask.

Anticlea elegans (Pursh) Rydb.

Puccinia atropuncta Peck. & Clint. III Saskatoon, Sask. Rather rare.

Arabis brachycarpa (T. & G.) Britton

Puccinia monoica (Peck.) Arth. This rust is common on the high banks of the South Saskatchewan river at Saskatoon, Sask. It is probably the first rust to appear there each spring. This year the pycnia were collected April 21, and the aecia on May 20. (R. C. Russell)

Arisaema Trifolium (L.) Schott

Uromyces Caladii (Schw.) Earl. Fredericton, N.B. June 15, 1930.

Artemisia sp.

Puccinia universalis Arth. 0 & I St. Gregor, Sask.

Calamagrostis canadensis (Michx.) Beauv.

Claviceps purpurea (Fr.) Tul. Nestow, Alta. The grass was severely infected over a large area in the sand hills (zone 10). (A. W. Henry).

Calamovilfa longifolia (Hook.) Hack.

Puccinia anagigena Diet. III Sutherland, Sask. The rust is common on this host. Nemexia lasioneuron (Hook.) Rydb. (Smilax herbacea Coult.) was growing within a few rods of this location. (R. C. Russell.)

Capsella Bursa-pastoris (L.) Medic.

Cystopus candidus (Pers.) de Bary Lincoln county, Ontario.

Chrysopsis hirsutissima Greene

Puccinia Stipae (Opiz.) Arth. I. Saskatoon, Sask. "This is the first time that P. Stipae has been reported on this host in Saskatchewan, as far as I am aware. It is listed in the North American Flora on C. villosa in Montana". (R.C. Russell).

Cirsium arvense L.

Puccinia sauveolens (Pers.) Rostr. This rust is very prevalent throughout Annapolis and Kings counties, N.S. (J. F. Hockey).

Cirsium sp.

Puccinia Cirsii Lasch II. St. Gregor, Sask.

Uromyces Junci (Desm.) Tul. O.I. Saskatoon, Sask. Common on the native "bull" thistle.

Clematis ligusticifolia Nutt.

Puccinia Clematidis (DC.) Lagerh. O.I. Saskatoon, Sask. This rust was heavy on a vine growing under cultivation. (C.H. Bryce).

Crataegus chrysocarpa Ashe

Gymnosporangium clavariiforme (Jacq.) DC. Pycnia were well developed on July 3 and the aecia were past their best on July 31, at Saskatoon, Sask.

Elymus condensatus Presl.

Claviceps purpurea (Fr.) Tul. Pincher Creek, Alta.

Eupatorium purpureum L.

Erysiphe cichoracearum DC. Collected in P.E.I.

Galium boreale L.

Puccinia rubefaciens Johans. III. Battleford, Saskatoon and Humboldt, Sask. The rust was heavy at the last place. The sori were surrounded by reddish borders.

Phoma elliptica Peck. appeared to be killing a patch of Galium boreale at Saskatoon, Sask. The stems showed lesions and the

leaves were yellowing and then turning dark. Last year's stems which were still standing were covered with pycnidia of a fungus, which was identified as Phoma elliptica by Dr. Dearness (R.C. Russell).

Glaux maritima L.

Puccinia Distichlidis O.I. Undora, Sask. Light infection.

Glycyrrhiza lepidota (Nutt.) Pursh

Uromyces Glycyrrhizae (Rabh.) P. Magn. Saskatoon, Sask. The telia were scattered irregularly over the leaf and therefore looked quite different from the systemic uredinia. The uredinial stage was also collected at Saskatoon and Humboldt.

Grindelia squarrosa (Pursh) Dunal

Puccinia Grindeliae Peck. III. Saskatoon, Sask. A fairly heavy infection was found in an open pasture.

Halerpestes cymbalaria (Pursh) Greene

Puccinia Clematidis (DC.) Lagerh. O.I. Common on this host about Saskatoon, Sask.

Helianthus subtuberosus Bourgeau

Puccinia Helianthi Schw. III. Saskatoon, Sask. Infection fairly heavy.

Hordeum jubatum L.

Ustilago Lorentziana Tuck. This smut was collected 8 times in zones 2-4 and 10-11 in Alta. The infections were local. One collection also made near Windermere, B.C., (G.D. Sanford). It was collected at Indian Head, Sask.

Puccinia graminis Pers. Ferintosh and Jarrow, Alta.

Iva axillaris Pursh

Puccinia intermixta Peck. I. Allan, Sask. Heavy systemic infection was found on some plants.

Juncus balticus Willd.

Uromyces Junci (Desm.) Tul. III. Saskatoon, Sask., Sept., 16, 1930. The rust was heavy and common. Cirsium near by bore pycnia and aecia on July 1.

Juncus longistylis Torr.

Uromyces Silphii (Burr.) Arth. (U. Junci-tenuis Syd.) II. III. Saskatoon, Sask., Sept. 1, 1930.

Lactuca pulchella (Hook.) Kuntze

Puccinia hemisphaerica (Pk.) Ell. & Ev. O.I. Radisson and Tessier, Sask.

Lappula Lappula (L.) Karst.

Peronospora Echinosperti Swingle Locally on a patch of blue burr at Saskatoon, Sask.

Leontodon autumnalis L.

Yellows (Virus) Five per cent of the plants, Kings county, N.S.
Puccinia Hieracii (Schum.) Mart. Queens county, P.E.I. Infection light.

Lepidium densiflorum Schrad.

Peronospora Lepidii (McAlpine) G. W. Wilson. The downy mildew produces witches broom on the host. This disease is common around Saskatoon, Sask. (R.C. Russell)

Limonium carolinianum (Walt.) Britton

Uromyces Limonii (DC.) Lév. Queens county, P.E.I. Plants noticeably injured.

Lygodesmia juncea Don.

Puccinia patruelis Arth. I. Saskatoon, Sask. Not abundant.

Malvastrum coccineum (Pursh) Gray

Puccinia Sherardiana Horn. III. Saskatoon and Glenside, Sask.

Nabulus racemosa (Michx.) DC.

Puccinia orbicula Pk. & Clint. III. St. Gregor, Sask. Common in the Humboldt district.

Puccinia patruelis O. I. St. Gregor, Sask.

Norta altissima (L.) Britt. (Sisymbrium altissimum L.)

Peronospora parasitica (Pers.) de Bary Saskatoon, Sask. Material collected Sept. 16, bore an abundance of oospores in the affected areas. These spots were overgrown with Alternaria. (E. G. & R. C. Russell).

Cystopus candidus (Pers.) de Bary Saskatoon, Sask. Trace found.

Oenothera biennis L.

Uromyces plumbarius Peck. O. I. Kentville, N. S. Few plants found.

Erysiphe Polygoni DC. York county, N.B.

Phalaris arundinacea L.

Claviceps purpurea (Fr.) Tul. Clyde, Alta.

Phlox Hoodii Richards.

Puccinia Douglasii Ell. & Ev. O. I. Saskatoon, Sask. The aecial stage is found occasionally in this district.

Plantago major L.

Yellows (Virus) Affected plants were collected by Mr. Groh in the lawn of the Arboretum, Experimental Farm, Ottawa, Ont., in May. The disease has been noted in previous seasons. Plants of the common milk weed (Asclepias syriaca L.) and toadflax (Linaria vulgaris Mill) were also collected by Mr. Groh, in Ottawa West. Diseased plants were sent to Dr. L. O. Kunkel. He reported that the symptoms were typical of yellows, but he had never seen it on toadflax, nor had he tested the plant experimentally.

Erysiphe Cichoracearum DC. Severe and widespread this season in York county, N.B.

Poa pratensis L.

Claviceps purpurea (Fr.) Tul. Midnapore, Alta.

Physalis ?heterophylla Nees

Puccinia Physalidis Peck. A heavy infection on plants in an orchard in Rouville county, Que.

Potentilla viridescens Rydb. and P. ?flabelliformis Lehm.

Phragmidium Ivesiae Syd. III. Saskatoon. This species is not collected as commonly as P. Potentillae in this area.

Potentilla sp.

Phragmidium Potentillae (Pers.) Karst. York county, N.B.

Portulaca oleracea L.

Cystopus Portulacae (DC.) Lév. Plants moderately infected at Experimental Station, Fredericton, N.B.

Prunus melanocarpa (A. Nels.) Rydb.

Dibotryon morbosum (Schw.) Theiss. & Syd. conidial stage collected at Qu'Appelle, Sask. July 13, 1930.

Prunus pennsylvanica L. f.

Coccomyces hiemalis Higgins (Cylindrosporium Padi Karst.) A moderate infection of this shot hole was reported from Saskatoon.

Prunus virginiana L.

Dibotryon morbosum (Schw.) Theiss. & Syd. Quite severe on chokecherry in vicinity of Agricultural College, Winnipeg, Man. It was also reported from Neepawa, Man. A severe infection was observed at Hawkesbury, Ont. The disease is severe in many parts of New Brunswick on chokecherry and related species. (D.J. MacLeod)

Pulsatilla ludoviciana (Nutt.) Heller.

Puccinia suffusca Holw. Saskatoon, Sask. This rust is not very common.

Rhamnus cathartica L. (escaped)

Puccinia coronata Corda Trace collected June 3, at Fairy Lake, Que.

Rubus ?melanolasius Focke

Mycosphaerella Rubi Roark (Septoria Rubi West.) The imperfect stage was abundant in a sheltered valley of a creek at Beaver Creek, Sask.

Rubus strigosus Michx.

Pucciniastrum americanum (Farl.) Arth. Queens county, P.E.I.

Rubus triflorus Richards

Gymnoconia Peckiana (Howe) Trotter Severe at Experimental Station, Fredericton, N.B. The disease is widespread in the province on this species.

Sabina horizontalis (Moench.) Rydb.

Gymnosporangium juvenescens Kern. Sutherland, Sask. This rust causes witches' brooms on the host. It is quite common along the river.

Gymnosporangium corniculans Kern. Sutherland, Sask. This rust is fairly common on the steep slopes of the river bank where Sabina and Amelanchier grow in fairly close proximity to each other.

Sanicula marilandica L.

Puccinia marylandica Lindr. St. Gregor, Sask. Aecia collected June 5, and telia July 16 and August 29. Rust was not plentiful although the host was abundant.

Sideranthus spinulosus (Pursh.) Sweet

Puccinia Grindeliae Peck. Southey, Sask. Heavy infection.

Solanum triflorum Nutt.

Entyloma australe Speg. Saskatoon, Sask. Not very plentiful this year, although common in some years.

Solidago sp.

Coleosporium Solidaginis (Schw.) Thüm. York county, N.B.

Stieronema ciliatum (L.) Raf.

Puccinia Dayi Glint. III. Saskatoon, Sask. Heavy infection. Also collected at Englefield, Sask.

Symphoricarpos occidentalis Hook.

Puccinia Crandallii Pamm. & Hume O. I. Carmel, Sask.

Septoria Symphoricarpi Ell. & Ev. Lyston and Saskatoon, Sask.

Taraxacum officinale Weber

Puccinia Hieracii (Schum.) Mort. Very common in Lincoln county, Ont. Abundant in Nova Scotia.

Sphaerotheca Humuli (DC.) Burr. var fulginea (Schlecht.) Salmon Common and severe in York county, N.B.

Ramularia Taraxaci Karst. Indian Head, Sask. Very common.

Tithonia speciosa Hook. (cult.)

Sclerotinia Sclerotiorum (Lib.) de Bary Experimental Station, Morden, Man. Plants completely destroyed. The seed from which these plants were grown was imported from South Africa.

Vicia Cracca L. (Cow vetch)

Erysiphe Polygoni DC. Queens county, P.E.I. Apparently injurious.

Vicia sparsifolia Nutt.

Uromyces albus Diet. & Holw. O.I. Saskatoon, Sask., May 19; and

Radisson, Sask. Common about Saskatoon. The rust changes the habit of the host. The plant is erect instead of decumbent and is also modified in other ways.

Viola canadensis L.

Puccinia Violae (Schum.) DC. Saskatoon, Sask.

Viola sp.

Puccinia Violae (Schum.) DC. York county, N.B.

INDEX OF HOSTS

Only the names of the cultivated plants have been included in this index. For diseases on plants not under cultivation the section on "Diseases of Miscellaneous Plants" should be consulted.

Alfalfa	29	Egg Plant	42
Apple	57	Elm	79
Apricot	63		
Artichoke, Jerusalem	42	Flax	33
Asparagus	37		
Ash	78	Gladiolus	87
		Gooseberry	67
Balsam Fir	78	Grape	68
Barberry	85	Grasses, Cultivated	35
Barley	19		
Bean	37	Hawthorn	79
Bean, Broad	39	Hemlock	79
Beech	78	Hollyhock	88
Beet	39	Honeysuckle	88
Begonia	85	Horsechestnut	79
Birch	78		
Blackberry	63	Iris	88
Blueberry	64		
Buckwheat	36	Juniper	80
Butternut	78		
		Larkspur	89
Cabbage	40	Lettuce	42
Cantaloupe	40	Lilac	89
Caragana	85	Lily	89
Carnation	85		
Carrot	40	Maple	80
Cauliflower	40	Mountain Ash	80
Celery	41		
Centaurea	85	Narcissus	90
Cereals, General	28		
Cherry	64	Oak	80
China Aster	86	Oats	13
Chrysanthemum	87	Onion	43
Clover, Common	30		
Clover, Sweet	32	Pansy	90
Corn	32	Pea	43
Cranberry	65	Peach	68
Cucumber	41	Pear	70
Currant	66	Peony	90
		Pepper	44
Dahlia	87	Pine	81

Plum 71
Poplar 82
Potato 45
Primula 90

Raspberry 72
Rhubarb 49
Rose 90
Rutabaga 49
Rye 25

Snapdragon 92
Spinach 50
Spruce 83

Strawberry 75

Sunflower34
Sweet Pea92

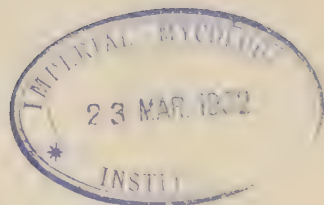
Tobacco50
Tomato52
Tulip93
Turnip55

Vetch36
Vinca93

Walnut, English79
Wheat1
Willow83

Zinnia93

DOMINION OF CANADA
DEPARTMENT OF AGRICULTURE
EXPERIMENTAL FARMS BRANCH



H. T. GUSSOW
Dominion Botanist

E. S. ARCHIBALD
Director

ELEVENTH ANNUAL
REPORT
OF THE
CANADIAN
PLANT DISEASE SURVEY
1931
Compiled by
I. L. Connors
Plant Pathologist

FOREWARD

The eleventh annual report of the Canadian Plant Disease Survey is considerably larger than the two previous reports. Such an increase in size is a direct reflection of the sustained interest of our collaborators in reporting the diseases in their territory. There has been a marked increase in the number of reports received. Several diseases new to Canada were recognized this year and reported to the Survey. In a number of instances, collaborators have included notes, which add greatly to the interest of the record. Besides these diseases, several others previously known to the individual collaborator in his section of the country were reported to the Survey for the first time. These diseases, however, are not indicated as new to Canada.

In addition to the regular Survey, Dr. G. R. Bisby has contributed a paper on "The Additions to the Fungous Flora of Manitoba" and Mr. René Pomeroy has presented a summary of his work on "The Distribution of White Pine Blister Rust in Quebec". These two contributions appear as separate sections under the name of their authors. I am sure these papers will be of interest.

Although I have not added a list of collaborators, I wish to thank most cordially everyone who has contributed to the Survey. The names of many appear through the report, for when an item is of particular merit or where its value would be enhanced by the inclusion of the collaborator's name, it has been added at the end of the record. I am particularly indebted to Drs. A. W. Henry, G. B. Sanford, and P. M. Simmonds and their assistants for the comprehensive reports of diseases in Alberta and Saskatchewan. Dr. Wm. Newton has reported many diseases on Vancouver Island and in the lower Fraser Valley, which have not been previously noted in the Survey from that part of the Dominion. Mr. R. C. Russell of the Dominion Laboratory of Plant Pathology, Saskatoon, has continued to furnish records of his collections of parasitic fungi of Saskatchewan. Mr. H. N. Racicot of the Central Laboratory has contributed many records for Quebec. Special thanks are due to Dr. John Dearnness for his unfailing interest and assistance. Both my collaborators and myself are indebted to him for the identification of many fungi, which would otherwise have remained undetermined.

A more simple and direct title has been adopted for the report to replace the one previously used. However, this report is numbered to conform with those already issued.

Suggestions, whereby the number of pages may be reduced without impairing the usefulness of the report, would be welcome. Up to now, I have attempted to retain the style of the early reports at the same time economizing on space in the actual typing.

March 15, 1932,
Division of Botany,
Ottawa, Canada.

I. L. Conners,
Plant Pathologist.

I. DISEASES OF CEREAL CROPS

WHEAT

STEM RUST - Puccinia graminis Pers.

B.C. - Stem rust was collected at Salmon Arm, Falkland, Koksilah, Mill Bay, Cobble Hill and Saanichton (M. Newton).

Alta.- Stem rust was first observed on August 20 on Garnet wheat at the Experimental Farm, Lacombe. Out of 825 fields examined, it was found in 15, which were located chiefly in zones 8 and 10.

Sask.- Stem rust appeared relatively late this year in Saskatchewan. It was first found at Saskatoon on July 25, and at Indian Head on July 27. Traces of stem rust were present in southern Saskatchewan on August 12, but the crop was practically ripe by that date. In northern Saskatchewan the grain was much heavier and later. However, damage from rust was very slight, except possibly in fields near the Manitoba boundary.

Man. - Heavy infections of stem rust were confined almost entirely to the area between the Red River on the east and a line joining Pilot Mound, Treherne and Lake Manitoba on the west, where the grain crops were the heaviest in the province. The average infection on common wheat in this area was 20 per cent, while in the southern part of the Red River valley it reached 25 per cent. The loss from rust in the larger area was estimated to be 3 to 3 per cent; in the Red River valley it varied from 5 to 10 per cent. In the south-western part of Manitoba the crops were much lighter and the loss from stem rust was placed at 0 to 1 per cent. In the northern half of the province most of the crops matured early and only traces of rust developed. However, in fields, where the grain was late, infections ranging from 20 to 40 per cent were present. The average loss in the northern half was one to 5 per cent.

Weather conditions appeared to play an important role in the spread of stem rust this year. During the first three weeks in June, precipitation was less than half the normal rainfall and heavy dews, which normally occur at night during this period, were almost entirely absent. On the other hand, during the last few days of June and the first week of July, the weather was very favourable for both spore germination and the development of the rust fungus. In consequence, although stem rust was not found until July 5, when traces of rust were observed at Morden and Morris, a sprinkling of rust was present throughout the southern part of Manitoba on July 8. Rust development continued very rapidly, so that on July 10

and 11, infections were reported as follows: Winnipeg, one per cent of the culms; Morris, 5 per cent; Morden, 30-40 per cent; and near Portage la Prairie, less than one per cent, with intermediate infections at places between those mentioned. Throughout the area, stem rust was less prevalent on Reward than on Marquis and Garnet, and less on Ceres than on Reward. Again, the average daily temperature was above normal during June and July. The crops were sown early and both reserve soil moisture and current rainfall were below normal. As a result most fields of cereals were rapidly maturing by the end of July and 95 per cent of the crops were ripe on August 10. The early ripening of the crops effectually halted further rust development.

In most fields of durum wheat only traces of rust were found. In one an infection of 25 per cent was reported.

Ont.- Pycnia of stem rust were found on May 12 and aecia on May 26 on the common barberry in the Arboretum at Ottawa.

In Carleton county most fields of wheat showed traces of stem rust. In one field infection varied from a trace to 5 per cent; the damage was nil. In Elgin county, three fields were examined, but no stem rust was observed.

Que.- Aecia of stem rust were found on twelve bushes of barberry in Mississiquoi county.

In L'Islet and Kamouraska counties, eight fields of Huron wheat were examined. Infection ranged from 10 to 50 per cent. At Macdonald College only a light infection was observed, apparently causing little or no damage.

N.B.- A trace of stem rust was found on wheat throughout the province.

N.S.- Specimens of the common barberry bearing mature aecia in abundance were received on July 1 from Cape Breton.

P.E.I.- The infection of stem rust was the heaviest observed on wheat for some time. Unlike its distribution in previous years, it was general throughout the Island. It caused a marked weakening of the straw and moderate to severe damage to the grain.

LEAF RUST - Puccinia triticina Erikss.

B.C.- Leaf rust was collected at Salmon Arm (several fields), Falkland, Koksilah, Cobble Hill, Mill Bay and Saanichton (M. Newton).

Alta.- Leaf rust was found in 10 per cent of the fields examined, being reported first on August 3. It was fairly abundant in zones 6, and 8 to 10, especially zone 8, where 26 fields out of 102 examined were rusted. In the rest of the province leaf rust was almost absent. The damage was estimated as follows: 30 fields, nil; 49 fields, less than 0.1 per cent; 3 fields, 0.1 to 1 per cent.

Sask.- Leaf rust was first reported on July 28 at Saskatoon. In south-eastern Saskatchewan it was fairly heavy in localized areas. It caused little or no damage except possibly in that part of the province.

Man.- Leaf rust was as widespread in the province as stem rust, but it was, as usual, less severe. Infections of leaf rust were light on Marquis, Reward, Garnet and Ceres, while fairly heavy infections were observed on Ruby and Kota. Traces only of rust occurred on durum wheat.

Leaf rust was first found on June 23 at Emerson, only a single pustule being collected. It was not again observed until July 5 and a trace was present throughout southern Manitoba by July 10. Unlike previous years, leaf rust was less prevalent than stem rust in the early part of the season. Usually the former is quite abundant by the time the latter makes its appearance. Doubtless the failure of leaf rust to develop, was due to the unfavourable weather conditions prevailing during most of June, which are briefly discussed under stem rust.

Que.- Leaf rust was reported from L'Islet, Kamouraska and Jacques Cartier counties. In general no damage occurred; some late fields may have suffered slightly.

Ont.- Leaf rust was fairly heavy on wheat in Carleton county, while there was a moderate infection on winter wheat in Elgin county. The damage was probably not more than a trace in either.

N.B.- Leaf rust was general on the plots of the Experimental Station, Fredericton.

N.S.- Although leaf rust was common on Marquis and Huron wheat in Kings county, it was not severe, except in late fields.

P.E.I.- Leaf rust was first reported on August 1, when it was observed on Huron wheat in Queens county. The outbreak was general over the Island. This rust was common and destructive to the leaves, but the amount of damage, which it caused, is difficult to estimate.

STRIPE RUST - Puccinia glumarum (Schmidt) Erikss. & Henn.

Dr. Margaret Newton has given a complete record of the collections of stripe rust which she has studied at the Dominion Rust Research Laboratory, Winnipeg, from 1927 to 1931. All these collections were made by Dr. Newton, except a few, where the collectors are indicated. The host and the place of collection are given below.

B.C.- Wheat: Dawsons Gold Chaff at Saanichton; Agropyron Richardsoni (Trin.) Schrad. at Point Gray, Mill Bay, Duncan, Agassiz; Bromus marginatus Nees at Victoria; B. sitchensis Bong. at Victoria, Duncan, Agassiz; Elymus glaucus Buckley at Victoria; E. Howellii Scribn. & Merrill at Victoria; E. marginalis Rydb. at West Saanichton; E. sp. at Victoria; Hordeum caespitosum Scribn. at West Saanichton (W. Newton); and H. jubatum L. at Victoria.

Alta.- Wheat: Chagot, Kubanka, Little Club and Stanley at Olds; Barley: O.A.C. at Olds; Agropyron Richardsoni at Edmonton; A. Smithii Rydb. at Red Deer; A. tenerum Vasey at Olds and Hobbema; and Hordeum jubatum at Lacombe, Olds, Red Deer, Edmonton and Hobbema.

Besides the report received from Dr. Newton, Dr. Sanford and his staff report the following collections of stripe rust in Alberta in 1931. Wheat: Chagot, Kubanka, Little Club at Olds; Chagot, Early Baart at Edmonton. Barley: O.A.C. 21 at Olds; White Barbless at Edmonton. Native grasses: Hordeum jubatum at many places from Calgary north and north-east to the Saskatchewan border and north to about the 54th parallel of latitude; Agropyron Richardsoni and A. tenerum at Hobbema, Mundare and in several locations near Vermilion; A. Smithii near Vermilion; on these native grasses and Bromus ciliatus L. in a grass nursery, Edmonton. Introduced grasses under cultivation: A. cristatum, A. desertorum, A. elongatum, A. obtusiusculum and A. sibiricum in University plots, Edmonton.

Collections of stripe rust from 1926 to 1930 found on wheat, barley and native grasses in many parts of Alberta and at Windermere, B.C. are recorded in the Plant Disease Surveys for these years. A complete list of varieties of wheat and barley found attacked by stripe rust in Alberta to

date is as follows. Wheat: White Federation, Bunyip, Marquis 7, Early Baart, Chagot, Bishop, Vermilion, Early Red Fife, Early Java, Little Club, Prelude, Reward, Jones Fife and Kitchener; Barley: O.A.C. 21 and White Barbless.

Sask.- Wheat: Marquis at Pontieux (B.J. Sallans) and Alsask (T.C. Vanterpool & J.H. Truscott); Aegilops sp. at Saskatoon.

Dr. Newton has found that all collections of stripe rust that she has cultured can infect wheat.

BUNT - Tilletia Caries (DC.) Tul. and T. foetens (Berk.) Trel.

In addition to the field surveys in the separate provinces, the following table on wheat bunt, prepared by Mr. Wm. Popp from the records of the Western Grain Inspection Division covering Western Canada for the three months ending Oct. 31, 1931, may be of interest.

Wheat Bunt in Western Canada.

(Summary of inspections from Aug. 1 to Oct. 31, 1931).

	Cars Inspected	Cars "Smutty"	Percentage "Smutty"
Hard Red Spring	53,794	607	1.1
Alberta Red Winter	57	8	14.0
Durum	3,509	200	5.6
All wheat	57,456	816	1.4

Compared with last year there has been a marked reduction in the amount of smutty durum wheat, 16.6 per cent grading smutty in 1930 as against 5.6 per cent this year. Hard Red Spring wheat is also somewhat freer of bunt and as a result the percentage of all wheat grading smutty for the quarter has fallen from 2.8 per cent in 1930 to 1.4 per cent in 1931.

B.C.- A sample of winter wheat, O.A.C. 104, grown at Armstrong in 1931, was found heavily inoculated with spores of Tilletia Caries. Evidently bunt had destroyed a high percentage of the heads. The correspondent noted that the infected heads were borne on culms, which were considerably shorter than those bearing healthy heads.

Alta.- Bunt was widely distributed in Alberta. It was found in 51 fields out of 825 examined. However, the individual infections were higher in the northern part of the province; an infection of 40 per cent was observed in one field in zone 8, and 50 per cent in one in zone 9. Tilletia foetens was confined mostly to the southern part of the province.

Sask.- Bunt was reported from 15 fields out of 240 examined. In most fields only a trace was present; in a few, infections of one to two per cent were observed. In general Tilletia Caries was more prevalent than T. foetens. In a small increase plot of the variety Liguleless at the University of Saskatchewan over 10 per cent of bunt was observed.

Ont.- Bunt due to Tilletia foetens was found in three fields of Huron wheat out of four examined in Elgin County. In two fields 4 per cent of the heads were bunted while in the other field 28 per cent were destroyed.

Que.- An average infection of 25 per cent of bunt (T. foetens) was observed in three fields of Huron wheat in L'Islet and Kamouraska counties.

P.E.I.- A single head was found affected with Tilletia foetens in Queens county.

LOOSE SMUT - Ustilago Tritici (Pers.) Jens.

Alta.- The average damage from loose smut was reported as only 0.04 per cent, the highest loss being 2 per cent. Nevertheless, out of 825 fields examined, 43 or 5.2 per cent were affected and in zone 10 out of 376 fields, 31 or 8.2 per cent were smutted.

Sask.- Out of 240 fields examined, 52 or 21.7 per cent were affected with loose smut. When the fields that were inspected were classified according to variety, it was found that the percentage of fields of each variety infected, was as follows: Marquis, 10 per cent; Garnet, 25; Ceres, 83; and Reward, 86.

Man.- Loose smut was present in 47 out of 48 fields examined. Infections were recorded as follows: 36 fields, trace to one per cent; 5 fields, 2 per cent; 4 fields of Reward, 2 to 7 per cent; 1 field of Kota, 3.6 per cent; 1 field of Ceres, 4 per cent. A trace to 1 per cent of smut was present in 13 out of 14 fields of durum wheat examined.

Ont.- Loose smut was again prevalent throughout western Ontario. Infection varied from 2 to 15 per cent. In Carleton county traces of smut were observed.

Que.- Infection by loose smut varied from 5 to 20 per cent in 8 fields of Huron wheat in L'Islet and Kamouraska counties, two fields showing the higher figure.

P.E.I.- Loose smut affected 15 per cent of the heads in a field of Huron in Queens county.

BLACK CHAFF - Pseudomonas translucens J.J. & R. var. undulosa (S.J. & R.) Stev.

Alta.- Black chaff was found in ten fields out of 828 examined and the damage was estimated at a trace.

Man. - Black chaff was reported from one field.

BASAL GLUME ROT - Pseudomonas atrofaciens (McCull.) Stev.

Alta.- Basal glume rot was reported from 10.3 per cent of the 825 fields examined. The heaviest infections were in zones 9, 10 and 11, where appreciable damage was caused in some fields.

Sask.- Out of 240 fields, 6 were found affected with basal rot and, although 10 per cent of the heads were affected in one field, the damage appeared to be slight. The disease was observed principally in the Battleford area, where infected fields were seen in addition to those reported.

Man. - Basal glume rot was severe in the two fields, where it was observed.

ERGOT - Claviceps purpurea (Fr.) Tul.

Alta.- Ergot was observed in only four fields. The highest infection was 2 per cent in one field in zone 11,

P.E.I.- Ergot was not common this year. Only traces were observed.

POWDERY MILDEW - Erysiphe graminis DC.

Alta. - Heavy infections of powdery mildew were common in experimental plots and in lodged places in fields.

Man. - A trace of powdery mildew was observed in one field.

Ont.- In a field of Huron wheat in Elgin county, the lower leaves were slightly affected.

P.E.I.- Powdery mildew was not common this year and where present caused slight damage.

GLUME BLOTCH - Septoria nodorum Berk.

Alta.- Glume blotch was reported in 175 or 21.2 per cent of the fields examined. The disease was reported from zones 6 and 8 to 11, the average damage being 0.4 per cent.

Sask.- Very little glume blotch was reported in southern Saskatchewan. It was found more frequently in the Battleford area, but it was generally present only on heads borne on prostrate culms.

Man.- A slight amount of glume blotch was reported in one field.

Que.- Glume blotch affected several varieties in Quebec, but the damage was apparently slight.

N.S.- Of all the varieties grown at the Experimental Farm, Nappan, Hope was the most severely affected with glume blotch. Seventy-five per cent of the heads were attacked.

P.E.I.- Glume blotch caused slight to moderate damage on the Island.

LEAF SPOTS

Alta.- Leaf spots reported to be due to Septoria Tritici Desm. were found in 26 or 3.4 per cent of the fields examined. The spotting was present in zones 8 to 13 only. The damage was estimated as follows: 9 fields, none; 17 fields, trace.

Sask.- Leaf spots were found in 68 fields out of 240 examined. They appeared to be more common in the zones that suffered least from drouth. The spots were caused by Septoria Tritici and S. nodorum in some cases.

ROOT ROTS

As in previous reports the root rot diseases are considered together with special reference to the specific pathogens as far as they are reported.

Alta.- Take-all (Ophiobolus graminis Sacc.) was reported in 247 fields out of 825 examined or 29.9 per cent of the fields visited. The average damage was estimated to be 1.1 per cent for all the fields surveyed, or 3.6 per cent for the diseased fields. In zone 9, where soil moisture was sufficient, the average damage was estimated to be 2.3 per cent. In zones 1 to 5 and in the southeastern sections of zones 6, 8 and 10, the soil was too dry for typical take-all symptoms to develop. In consequence probably many fields affected with take-all in these zones were not reported as only those where the symptoms were typical were included in this estimate.

Root rot attributed to Helminthosporium sativum Pamm. King & Bakke and Fusarium spp. was found in 474 out of 825 fields examined, the percentage diseased being 57.4 per cent. The average damage was estimated to be 0.5 per cent for the fields surveyed or 0.8 per cent for the diseased fields. All cases of root rot except those showing typical take-all symptoms have been listed here.

Sask.- Take-all was very little in evidence this year except in a few districts, which did not suffer from drouth. It was reported from 28 fields out of 293 examined. The average damage was estimated to be a trace in zones 1, 7 and 9, and moderate in zone 10. As in previous years infections were found on comparatively new land.

Root rot caused by Helminthosporium sativum and Fusarium spp. was reported from 290 fields out of 293 visited. The average damage was considered moderate in zones 1, 2 and 9, and slight in zones 7 and 11. This type of root rot was quite severe in some fields of the drier areas. It was present practically everywhere, but does little damage on new land. (R. C. Russell).

Survey trips made during the middle of June in zones 10 and 11 and in the northern sections of zones 7 and 9, revealed a surprisingly small amount of the Helminthosporium type of root rot on wheat seedlings. After the late June rains, the outer leaves that had been damaged earlier by soil drifting, drought, or frost, were heavily infected near the base with Helminthosporium sativum, which was rapidly spreading to the tissue beneath and thus causing severe late-seedling blight. The damage was moderate to severe. (T. C. Vanterpool).

Browning root rot was found in 13 out of 240 fields, examined. Eleven of these fields were found in zone 11. Some of the fields showed light, but definite symptoms of browning, but the damage appeared to be slight (R. C. Russell).

All reports of browning root rot were received from the eastern and northern parts of the province. Severe cases of browning root rot were observed on summerfallow at Prudhomme, Humboldt, Brada (southeast of North Battleford) and at the Experimental Station, Scott. On June 25th one of the best examples of the disease ever encountered was that found at Brada. Plants in the healthy patches averaged 4 to 8 inches higher than those in the diseased spots. Secondary or crown roots were plentiful and over 50 per cent of them were rotted at the tips. Pythium oospores were numerous. Browning root rot was difficult to locate in the field on account of injuries suffered by the plants from drought, frost and soil drifting. The disease showed about the same distribution and severity as last year, and was not as serious as in 1928. (T.C. Vanterpool).

Man.- Root rot attributed to Helminthosporium sativum and Fusarium spp. was reported from 148 fields. The damage in the individual fields varied from a trace to severe.

HEAD BLIGHT - Gibberella Saubinetii (Mont.) Sacc. & Fusarium spp.
Alta.- Isolated heads affected with head blight were found in five fields in zones 9 and 10.

Sask.- Head blight was found in three fields out of 240 examined. In one field two to three per cent of the heads were affected.

Que.- Head blight was found in several varieties at Macdonald College. The average infection was estimated to be one per cent. The damage was slight.

N.B.- Traces of head blight were observed in the experimental plots, Fredericton. One field of Garnet wheat showed 2 per cent of the heads blighted.

N.S.- Less than one per cent of head blight was present on several varieties at the Experimental Farm, Neppan. A trace was also present in the rod row plots at Kentville.

P.E.I.- One per cent of the heads of Red Fife were affected with blight in a field in Kings county. Damage was slight.

HEAD BLIGHT - Helminthosporium sativum Pamm. King & Bakke
Alta.- Traces of head blight were found in zones 4, 8 and 10.

Sask.- A trace was found on the low heads in two fields.

"BRITTLE DWARF" Disease - Cause unknown

Sask.- What is believed to be a new disease has been observed for the last seven or eight years in the Field Husbandry plots of the University at Saskatoon. Both winter and spring wheats are susceptible and certain hybrid varieties have shown extreme susceptibility. Affected plants are invariably stunted with a tendency to excessive stooling. The heads are occasionally malformed with the portion of the top internode just below the head somewhat twisted or otherwise distorted; usually, they are empty or contain only small shrivelled kernels. The stems are exceedingly brittle and may be broken off readily at or between the nodes. Aphids are associated with the diseased plants and commonly occur in masses under the leaf sheaths. In 1925 and 1928 bacterial lesions similar to black chaff were common on the majority of the affected plants, and this season a definite mottling of the leaves was noticed. It is possible that a disease complex is here manifest. Specimens were sent to Dr. H. H. McKinney, U. S. D. A., for examination. In his reply he mentions that it is not the same as the mosaic occurring in the United States east of the Mississippi river and says that, "It is a curious looking disease and I should say merits further study". The trouble can often be traced to what appears to be an infection source and is frequently severe enough to ruin one half of a fortieth acre plot. Individual plants have been found at widely separated points on the campus. Seed from diseased plants failed to reproduce the disease either in the greenhouse or field. It has not been seen outside Saskatoon. This note is intended to draw the attention of other pathologists to the disease so that they may be on the look out for it on survey trips. "Brittle Dwarf" is suggested as a common name. Saskatoon, Sask., September, 1931. (W. P. Fraser, P. M. Simmonds and T. C. Vanterpool).

STEM BREAK - Cause unknown

Sask.- Stem break is reported to occur to some extent every year in many fields in almost all parts of the province; the damage is slight. The trouble appears first about July 15. It was probably not as prevalent as usual this year. A little of the trouble was found in the University plots, Saskatoon (T. C. Vanterpool).

FROST INJURY

Sask.- During May several frosts killed back the leaves of wheat more or less completely in zones 7, 9, 10 and 11, and probably in others. Younger seedlings seemed to suffer more than older ones. The damage was probably slight in fields sown with plump, vigorous seed. The injury was aggravated by high winds and soil drifting. The degrees of frost at Saskatoon were:

May 5, 11.5°F.; May 19, 6.0°F; and May 20, 5.5°F.

SOIL DRIFTING

Sask.- Damage caused by high winds and drifting soil is probably not very great although the seedlings must suffer a setback due to abrasion and dessication. The damage is confused with frost injury. On six days in May the wind reached a maximum velocity of 31 to 41 miles per hour at Saskatoon.

LEAF DISTORTION - Cause unknown

Sask.- For several seasons the flag leaf has been found distorted in Hard Federation at Indian Head. Damage was apparently nil.

GLUME DARKENING - Cause unknown

Sask.- This condition occurs occasionally and is probably physiological. It does not appear to cause any harm.

NEMATODE DISEASE - Heterodera punctata Thorne

Sask.- Only one field affected with this root rot was reported this year. The parasite appears to die out as soon as rotation of crop is begun on new land.

OATS

STEM RUST - Puccinia graminis Pers.

B.C.- Stem rust was general on oats on Vancouver island. The damage was slight.

Alta.- Out of 149 fields examined only two were found rusted. The damage was a trace.

Sask.- Stem rust appeared very late this year. In southeastern Saskatchewan on July 12, the stage of the crop varied from the early milk to the firm dough, some fields being ripe. At that time rust infections varied from a trace to three per cent and the average damage was later estimated to be slight. In northern Saskatchewan where the crop was much heavier and later, damage from stem rust was slight in zone 7 and a trace in zones 9 and 11.

Man.- Stem rust of oats appeared at the same time and was about as prevalent as wheat stem rust. It was heaviest in the

southeastern part of the grain growing area, the average infection being 25 per cent in fields ripe by August 10. In the northern half of the province, stem rust caused an average infection of 5 per cent on the early crop. In both areas late fields were heavily rusted and considerably damaged. The losses due to rust were also about the same for oats as for wheat (see wheat stem rust).

Ont.- A trace of stem rust was found in Carleton county. Stem rust was heavy on late varieties in the crown rust nursery at Ottawa.

Que.- Stem rust infections varied from 10 to 25 per cent in six fields of Alaska oats examined in L'Islet and Kamouraska counties.

N.S.- Slight infections of stem rust were observed in two fields in Colchester county.

P.E.I.- Stem rust was present throughout the Island, infection averaging 10 per cent on August 15. It was abundant causing moderate to severe damage by September 1.

CROWN RUST - Puccinia coronata Corda

Man.- Traces of crown rust were found throughout southern Manitoba by July 27. Subsequently the infection became patchy in the Red River valley, varying from a light sprinkling of rust in some fields to 40 per cent infection in others. Damage from rust was confined to the late fields. Traces of crown rust could also be found late in the season in the southwestern part and the northern half of the province.

Ont.- Pycnia of crown rust were observed on May 11, and aecia on May 26 on buckthorn in the Arboretum, Ottawa.

Crown rust was very patchy in Carleton county, infections varying from a trace to 15 per cent, according to the field examined. The role of the buckthorn in initiating the infection was not established in the few fields examined. Some varieties were heavily infected in the crown rust nursery at Ottawa.

Que.- A slight infection of crown rust was observed in Jacques Cartier county, while 10 to 20 per cent of rust was found on Alaska oats in Kamouraska and L'Islet counties.

N.S.- Crown rust was heavy on late fields of oats at Nappan. The damage was slight. Rust infections were generally light in

the fields examined in Pictou, Halifax and Colchester counties, only occasionally causing slight damage.

P.E.I.- Crown rust was found on buckthorn at Charlottetown in July. The rust was abundant on oats this year and apparently caused moderate to severe damage.

SMUT - Covered Smut - Ustilago levis (Kellerm. & Swingle) Magn. and Loose Smut - Ustilago Avenae (Pers.) Jens.

Alta.- Out of 235 fields examined, 110 or 46.9 per cent were infected with smut. The average damage was estimated to be 1.4 per cent. Smut appeared to be somewhat heavier in the southern part of the province, but this may have been due to the small number of fields observed. Most of the fields were affected with covered smut; only in a few fields was loose smut recorded.

Sask.- Covered smut was found in 25 fields out of 42 examined, while loose smut was present in only six. In a few fields 20 per cent or more of covered smut was recorded, but in most fields the damage ranged from a trace to 5 per cent. In one field in zone 1, 2 per cent of loose smut was present; in the others, the infection was a trace. Sixty per cent of loose smut was reported by a farmer from Quill Lake, where the oats had not been treated.

Man.- Covered smut was somewhat more prevalent than loose smut. The former was reported as follows: 23 fields, trace to 6 per cent; 1 field, 15 per cent; 1 field, 50 per cent. The latter was found as follows: 19 fields, trace to 3 per cent; 4 fields, 10 to 25 per cent.

Ont.- Loose smut was very prevalent in Wellington county this year. In some infected fields 17 per cent of the panicles were smutted. Both the loose and covered smuts were reported from Carleton and Lincoln counties; the average infection was about 10 per cent for loose smut and 2 per cent for covered.

Que.- In five fields of Alaska oats in Kamouraska county, 2 to 5 per cent of the panicles were destroyed by loose smut. In a plot of Banner, Macdonald 44, at Macdonald College, 5 per cent of the panicles were affected with loose smut.

N.S.- Loose smut was reported in the following counties: Kings, less than one per cent in several fields examined; Colchester, 3 to 6 per cent in 4 fields; Pictou, 3 to 10 per cent on 2 fields. Similarly, covered smut was recorded as follows: Colchester, 3 per cent in 2 fields; Halifax, 6 per cent in one field.

P.E.I.-- Loose smut was abundant this year. Out of 50 fields examined throughout the province, 42 were smutty, infection ranging from a trace to 65 per cent, with an average infection of 8 per cent.

HALO BLIGHT - Pseudomonas coronafaciens (Ch. Elliott) Stev.

B.C.-- Halo blight was general on Vancouver island and caused slight damage.

Alta.-- Halo blight was reported from 42 fields out of 235 examined. The amount of damage in diseased fields was: 22 fields, none; 20 fields, a trace.

Sask.-- Halo blight was reported from 2 fields out of 46 examined. At Maryfield the infection was severe on the lower leaves. In addition 20 fields were affected with leaf spots, which caused a trace to very slight damage. In many fields these leaf spots may have been halo blight, but they differed somewhat in appearance from that disease.

Halo blight was reported from Lintlaw, where the disease had been noticed the previous year in the same locality. It was worse in low spots of the field, where the soil was peaty.

Que.-- Halo blight was very severe on several varieties at Macdonald College, infection varying from 10 to 100 per cent. This disease has been very serious on the College experimental plots and is interfering with the varietal tests. However, in a survey made last summer in several districts of the province, it was found to be of minor importance elsewhere.

BACTERIAL STRIPE BLIGHT - Bacterium (Pseudomonas)
striafaciens Ch. Elliott

Alta.-- Bacterial stripe blight was found in 48 out of 149 fields examined. The damage was as follows: 34 fields, none; 14 fields, a trace.

ROOT ROT

Alta.-- Root rot caused by Helminthosporium sativum and Fusarium spp. was found in three fields out of 149 examined. Damage was a trace.

Sask.-- Helminthosporium-Fusarium root rot was widespread (in 45 out of 49 fields examined), but it was rather mild in its action (damage, a trace). Crops on new land showed less lesioning on the average than those on older fields. In two

1/100th acre plots at Saskatoon about one per cent of the plants were affected with seedling blight due to Fusarium. The diseased seedlings were conspicuous on account of their yellow colour among the green and taller healthy ones.

Prematurity blight was present in four out of 42 fields. The disease was not very prevalent this year.

Man.- Helminthosporium-Fusarium root rot was found to some extent in Manitoba, causing a trace to slight damage.

BLAST - Cause unknown

Alta.- Blast was very common in all parts of the province. It was reported in 192 fields out of 235 examined. The average damage was estimated to be 6.1 per cent and in individual fields the loss was placed as high as 20 to 30 per cent.

Sask.- Blast was reported in 15 fields out of 46 examined. The trouble was quite noticeable this year; sometimes 90 per cent of the heads showed more or less blasting of the spikelets. The damage was slight to moderate. The extremely dry hot season may have favoured the disease.

N.S.- Blast was present in all the plots at Nappan and it was general in the ordinary fields.

P.E.I.- Blast caused slight damage in Queens county, average infection being 3 per cent in 25 fields.

LEAF BLOTCH - Helminthosporium Avenae Eidam

B.C.- Leaf blotch was general on Vancouver island. The damage was slight.

Alta.- It was found in 15 fields out of 235 examined. Damage was a trace only in the infected fields.

Que.- Leaf blotch was heavy on Alaska in Kamouraska and L'Islet counties.

N.B.- This disease was reported as general in York county.

SPECKLED LEAF BLOTCH - Leptosphaeria avenaria Weber (Septoria Avenae Frank)

Que.- Speckled leaf blotch caused slight damage to Banner, M.C. 44, on the plots at Macdonald College. It was present late in the season in several districts of Quebec, but infection took place too late to do any real harm.

N.B.- This disease was common along with leaf blotch, caused by Helminthosporium Avenae, at the Experimental Farm, Fredericton.

SEEDLING INJURY

Sask.- Oats suffered severe damage in the seedling stage in the experimental plots Saskatoon. The injury was probably due to frost, wind or drought, but it was impossible to decide which was the most important.

BARLEY

STEM RUST - Puccinia graminis Pers.

B.C.- Stem rust was collected at Salmon Arm and Cobble Hill. (M. Newton).

Alta.- Scattered local infections of stem rust were found late in the season, in five fields, all located in zone 10. It caused no damage.

Sask.- Stem rust was reported in 6 fields out of 24 examined. A mere trace of rust was found in zone 11, while more rust was found in some fields in zones 1, 2 and 7. Very little damage resulted.

Man.- Stem rust was prevalent on barley in Manitoba. It caused about the same amount of damage on barley as on wheat (see wheat stem rust).

Que.- Stem rust infections varied from 5 to 10 per cent in three fields in Kamouraska and L'Islet counties.

P.E.I.- In the plots at Charlottetown infections of stem rust varied from a trace or 10 per cent.

LEAF RUST - Puccinia anomala Rostr.

B.C.- Leaf rust was general on Vancouver island and in the lower Fraser valley. Damage was slight.

Man.- Slight traces of leaf rust were present throughout Manitoba.

Que.- Leaf rust infections varied from 3 to 5 per cent in two fields in Kamouraska county.

LOOSE SMUT - Ustilago nuda (Jens.) Rostr.

Alta.- Loose smut was found in 6 fields out of 116 examined. The highest infection observed was 6 per cent.

Sask.- This smut was reported from 6 fields out of 24 examined. Generally less than one per cent of the heads were smutted, except in a field at Midale and in a few experimental rows at Saskatoon, where five and seven per cent of the heads respectively were affected.

Man.- A trace to one per cent of loose smut was observed in 10 fields.

Ont.- Loose smut destroyed one per cent of the heads in a field in Carleton county.

N.S.- Three to 5 per cent of loose smut was reported in one field each in Colchester, Pictou and Halifax counties. One of the fields was in two-rowed barley.

P.E.I.-Loose smut affected 3 per cent of the heads in one field in Queens county.

COVERED SMUT - Ustilago Hordei (Pers.) Kellerm. & Swingle

Alta.- Covered smut was both common and destructive in Alberta. Out of 116 fields examined 62 or 53.5 per cent were smutty, the average damage being 2.3 per cent. The two highest infections were 25 and 70 per cent respectively.

Sask.- Covered smut was found in 10 out of 24 fields examined. Infection was usually only a trace, except in one field in zone 7, where 10 per cent of the heads were destroyed.

Man.- Covered smut was reported as follows: 10 fields, trace to one per cent; two fields, 3 to 4 per cent.

Que.- Very little covered smut was found at the Experimental Farm, Ste. Anne de la Pocatiere, but infections ranging from one to 3 per cent were found in 3 fields in Kamouraska county.

N.B.- A trace of covered smut was found at the Experimental Station, Fredericton.

P.E.I.- Covered smut affected up to 15 per cent of the heads in 10 fields in Queens and Kings counties.

STRIPE - Helminthosporium gramineum Rabh.

Alta.- Stripe was found in 14 fields out of 112 examined. The damage was as follows: 9 fields, trace; 3 fields, 1-5 per cent; 2 fields, 5-10 per cent.

Sask.- This disease was found only in the experimental plots at Indian Head and Saskatoon, where it was present on one or two varieties in each instance.

Man.- Stripe was found in 5 fields in Manitoba. The damage was slight in three fields and moderate in two.

N.B.- Barley stripe was reported from York county.

FALSE STRIPE - Cause undetermined

Sask.- Two per cent of the plants of O.A.C. 21 were affected in the rod row plots at Indian Head.

BACTERIAL BLIGHT - Pseudomonas translucens J.J. & R.

Alta.- Bacterial blight was present in 9 fields out of 78 examined. It caused a trace of damage in 3 fields.

NET BLOTCH - Pyrenophora teres (Died.) Drechs1.
(Helminthosporium teres Sacc.)

Alta.- Net blotch was found in 33 fields out of 116 examined. The damage was negligible, being none in 15 fields, a trace in 10, and light in 8.

Sask.- Net blotch was found in 16 fields out of 24 examined. Infections were usually very light in the southern part of the province and in the drier parts of zone 9, but some heavy infections were seen in the north, where the disease caused slight damage.

Man.- This disease was found in 7 fields, infections being a trace in 2 and moderate to severe in 5.

P.E.I.- Traces of net blotch were observed in the head row plots at Charlottetown.

SPOT BLOTCH - Helminthosporium sativum P.K. & B.

B.C.- Spot blotch was general on Vancouver island and in the lower Fraser valley. The damage was slight.

Alta.- Spot blotch was found in 20 fields out of 116 examined, causing no damage in 17 fields and a trace in 3.

Man.- A trace of spot blotch was found in 4 fields.

P.E.I.- Spot blotch was heavy in a field in Queens county.

ROOT ROT

Alta.- Root rot caused by Helminthosporium sativum and Fusarium spp. was reported from 5 fields out of 78 examined. the damage being a trace to slight.

Sask.- Helminthosporium-Fusarium root rot was found in 23 out of 34 fields visited. The damage was slight to moderate. Infection increased rapidly after July 1. The drier districts and the older fields showed the highest infections.

Prematurity blight was observed in three fields, all located in southern Saskatchewan.

Man.- Root rot of the Helminthosporium-Fusarium type was reported in 12 fields. The damage varied from a trace to moderate.

SCALD - Rhynchosporium Secalis (Oud.) Davis

B.C.- Scald was found severely injuring O.A.C. 21, Hammchen, Gold, Star, Plumage, Archer, Duckbill and Charlottetown in the experimental plots at Saanichton. Trebi appeared to be very resistant.

Alta.- Scald was found in 12 fields out of 116 examined, causing a trace to slight damage. The disease caused considerable damage on the experimental plots, at Vermillion, Lethbridge, Olds and Edmonton.

Sask.- A trace of scald was found in 3 fields out of 24 examined.

ERGOT - Claviceps purpurea (Fr.) Tul.

Alta.- A trace was found in one field out of 78 examined.

POWDERY MILDEW - Erysiphe graminis DC.

Que.- Powdery mildew was severe in one field in Megantic county.

P.E.I.- This disease was reported as severe on some volunteer barley in Queens county.

RYE

STEM RUST - Puccinia graminis Pers.

Man.- Stem rust did no damage to rye.

Que.- A light infection of stem rust was observed in Kamouraska county.

LEAF RUST - Puccinia dispersa Erikss.

Alta.- A trace of leaf rust was found in 3 fields out of 14 examined.

Sask.- Traces of leaf rust were reported from Kipling.

Man.- A trace of leaf rust was found at Gladstone.

Ont.- Two per cent of leaf rust was observed on rye growing in a field of wheat in Elgin county.

STEM SMUT - Urocystis occulta (Wallr.) Rabh.

Sask.- A trace of stem smut was found in one field near Neudorf. This single report is in marked contrast to the outbreak of last year, when 19 fields were found smutted, and infections varied from a trace to 11 per cent.

ERGOT - Claviceps purpurea (Fr.) Tul.

B.C.- Ergot was reported from Summerland on volunteer rye.

Alta.- Ergot was found in 12 fields out of 14 examined. The damage was a trace to light in most of the fields surveyed. Four growers living in zones 6 and 10 reported that ergot had caused heavy damage to their rye.

Sask.- Ergot was rarely seen in most parts of Saskatchewan this season. This was possibly due to the drouth in spring and early summer.

The disease was not common in the plots at Saskatoon, and what was present, was distributed unevenly. It appeared much later than usual and then on the late maturing heads.

Man.- A trace of ergot was reported from one field.

Ont.- A light infection of ergot occurred in rye grown as a cover crop in Lincoln county.

Que.- Three per cent of the heads of rye, Common 513, were affected with ergot at Macdonald College. A trace was also reported from Kamouraska county.

ROOT ROT

Sask.- Helminthosporium-Fusarium root rot was found in 12 fields out of 14 examined. The disease was common and widespread, but it caused only slight damage.

Man.- A trace of root rot was reported in two fields.

BACTERIAL BLIGHT - Pseudomonas translucens J.J. & R. var. Secalis (R. G. & J.) Stapp

Alta.- Bacterial blight caused a trace of damage in 4 fields out of 14 examined.

Sask.- A purple stem streak, possibly caused by bacteria was seen near Hafford. The infection was light.

LEAF SPOTS - Cause undetermined

Sask.- Leaf spots caused a trace of damage in 3 fields out of 14 examined.

II. DISEASES OF FORAGE AND FIBRE CROPS

ALFALFA

LEAF SPECK - Pseudopeziza Medicaginis (Lib.) Sacc.

B.C.- Leaf speck was general on Vancouver island and in the lower Fraser valley. The damage was slight. Wherever alfalfa was used as a cover crop in orchards in the Okanagan valley, it was severely affected with leaf speck.

Alta.- Although leaf speck was usually present and was severe in certain fields, the disease was apparently not as important as in previous years.

Sask.- Infections from leaf speck were very light, but only a limited number of fields were visited and in these, conditions had been very dry.

Man.- Leaf speck was not injurious at the Agricultural College, Winnipeg.

Que.- Leaf speck was heavy in several fields in Jacques Cartier county and it caused severe defoliation in some. A moderate infection was also reported in one field in Kamouraska county.

N.B.- Leaf speck was common on alfalfa throughout the province and caused moderate damage in some fields.

N.S.- From 10 to 70 per cent of the leaves were affected with leaf speck in the fields examined in Kings and Cumberland counties.

P.E.I.- Leaf speck was common, but caused little damage in Queens county.

SCLEROTINIA ROOT ROT - Sclerotinia Trifoliorum Erikss.

B.C.- Sclerotinia root rot was general on Vancouver island, but the damage was slight.

Alta.- Several fields were found, chiefly in zone 10, where Sclerotinia root rot caused a trace to moderate damage. Severe killing was produced experimentally at Lacombe and Edmonton. Symptoms of the disease are most easily observed during April and early May.

BACTERIAL BLIGHT - Pseudomonas Medicaginis Sackett

B.C.- Bacterial blight was found in one field only at Edgewood, Arrow Lake district, on June 17. The damage was about

6 per cent. Diagnosis of the disease was confirmed by laboratory examination and cultures. (J.W. Eastham).

Alta.- Bacterial blight was reported from 3 fields out of 13 examined. It caused a trace to slight damage.

LEAF SPOT and STEM CANKER - Ascochyta Meliloti (Trel.) Davis
Alta.- This disease was common and sometimes severe.

BROWN ROOT ROT - Phenodermus Meliloti Dearn. & Sanford
Alta. Brown Root Rot caused slight damage in 2 fields out of 10 examined. The damage is difficult to detect in fall inspections.

N.S.- Slight to moderate infection of brown root rot was observed on plants examined in fields of alfalfa, two or more years old, in Kings and Cumberland counties. Some plants die out in fields of all ages. The identity of the disease was confirmed by Dr. Sanford. (J.F. Hockey)

VIOLET ROOT ROT - Rhizoctonia Crecorum (Pers.) DC.

Alta. Rhizoctonia Crecorum was identified as the pathogen in two collections of root rot material from the Lethbridge district. A trace of infection was found (G. B. Sanford). In addition to this record violet root rot was also collected on potato in Saskatchewan this year (see under potato). It is believed that this disease has not been reported previously in Canada. Buddin and Wakefield (Trans. Brit. Myc. Soc. 12:116-140, pl. 11-14. 1927 and *ibid* 14: 97-99. 1929) present evidence to show that Helicobasidium purpureum (Tul.) Pat., one of the Auriculariales, is the perfect stage of Rhizoctonia Crecorum.

RUST - Uromyces Medicaginis Pass.

Man.- A few pustules of rust were found in Manitoba for the first time this year. It was collected at the Agricultural College, Winnipeg.

DODDER - Cuscuta sp.

B.C.- Dodder was severe in limited areas on Vancouver island.

COMMON CLOVER

POWDERY MILDEW - Erysiphe Polygoni DC.

B.C.- Powdery Mildew was general on alsike and red clover on Vancouver island and in the lower Fraser valley. The damage was slight on alsike and moderate on red clover. The disease was also quite general throughout the Okanagan valley.

Alta.- Powdery mildew is fairly common; infections vary from a trace to light.

Que.- Powdery mildew was found in four fields in Kamouraska and L'Islet counties. Infection was general in these fields. Moderate infections were reported on red clover in Missisquoi and L'Assomption counties.

N.B.- The disease was fairly common on red clover throughout the province. The damage was not estimated.

N.S.- Powdery mildew was general in a small area in a field of red clover in Colchester county.

P.E.I. - Powdery mildew was general on the second crop of red clover throughout the province in September, and caused slight to severe damage to the crop. The early infections on the first crop were not injurious.

RUST - Uromyces Trifolii (Hedw.?) Lév.

B.C.- Rust was general on red clover on Vancouver island and in the lower Fraser valley. The damage was slight.

Alta.- Rust was observed on alsike clover at Edson, Entwistle, Olds, Wetaskiwin and in several locations near Edmonton. Both the aecial and telial stage were collected at Edmonton, and the identification of the rust verified by Dr. G. R. Bisby.

Sask.- A fairly heavy infection of rust was collected on alsike clover near Melfort.

Que.- Rust was observed on red clover in Jacques Cartier county. Fully 75 per cent of the leaves bore pustules in the fall. Rust was also reported from two fields in Kamouraska county.

N.S.- Slight to moderate infections of rust were reported on alsike from Colchester county. The rust was also general and heavy on second-crop red clover in many places in the province.

P.E.I.- Moderate infections of rust on red clover were recorded.

PSEUDOPEZIZA LEAF SPOT - Pseudopeziza Trifolii Fuck.

B.C.- This leaf spot was general on red clover on Vancouver island and in the lower Fraser valley.

Alta.- Pseudopeziza leaf spot was collected at Lacombe.

N.S.- Moderate infection of the leaf spot was reported on red clover from 2 fields in Colchester county.

P.E.I.- This leaf spot was found in Queens county. Fifty per cent of leaves were affected, but little damage occurred.

CERCOSPORA LEAF SPOT - Cercospora zebrina Pass.

Alta.- Cercospora leaf spot was collected at Lacombe.

SOOTY SPOT - Dothidella Trifolii Bayl.-Elliott & Stansf.
(Polythrincium Trifolii Kunze)

Alta.- Sooty spot was collected at Wetaskiwin, Edmonton and Edson. It is fairly common on alsike clover late in the season. What was probably the pycnidial stage (Sphaeria Trifolii Pers.) was found by Dr. G. R. Bisby in a collection sent to him for examination.

Sask.- A trace of sooty spot was found on alsike growing by the roadside near Melfort July 31. Conidia were present.

N.S.- Sooty spot was general throughout the province on red clover. In Kings and Cumberland counties, 60 per cent of the foliage was affected in some fields.

DOWNY MILDEW - Perenospora Trifoliorum de Bary

Alta.- Light infections of downy mildew were observed at Edmonton and Wetaskiwin.

P.E.I.- Downy mildew caused moderate damage to the second growth of red clover in Queens county.

MOSAIC - Virus.

Alta.- Occasional plants were affected by mosaic.

N.B.- A few plants were found affected with mosaic at the Experimental Station, Fredericton.

SWEET CLOVER

LEAF SPOT and STEM CANCER - Ascochyta Meliloti (Trel.) Davis

Alta.- This disease was found in 10 fields out of 26 examined, infection varying from a trace to light in the affected fields.

MOZAIC - Virus

B.C.- Mosaic was present on 0.5 to 1.0 per cent of the plants of white sweet clover at Summerland.

Alta.- Mosaic is of fairly common occurrence, but apparently causes no damage.

BROWN ROOT ROT - Phanodermas Meliloti Dearn. & Sanford

Alta.- Brown root rot was found in 8 fields in zones 10 and 12 out of 26 examined in the province. The amount of damage was as follows: A trace in 4 fields, slight in 2 fields, and heavy in 2.

SCLEROTINIA ROOT ROT - Sclerotinia Trifoliorum Erikss.

Alta.- This root rot was found in 3 fields out of 26 examined, and caused severe damage in 2. The disease was probably present and did some damage in some of the other fields examined, but it is practically impossible to detect the disease and assess the damage in the fall, when most of these fields were surveyed.

CORN

SMUT - Ustilago Zeae (Beck.) Ung.

B.C.- Corn smut is rare on Vancouver island.

Alta.- A trace of smut was reported near Brooks.

Sask.- A single large gall was the only smut seen on the University plots, Saskatoon.

Ont.- Smut was prevalent on sweet corn, destroying the ears in the experimental blocks at the Vineland Station. It was also prevalent, in Wellington county, where 2 to 8 per cent of the plants were infected in many fields.

Que.- A trace of smut was present on the Experimental Farm, Ste. Anne de la Pocatière. Single fields in Kamouraska and Quebec counties showed 5, and 3-4 per cent infection respectively.

A trace was also found on Golden Bantam at Abbotsford and Waterville.

N.B.- A trace of smut was reported from a field in Victoria county.

RUST - Puccinia Sorghi Schw.

Man.- Rust was abundant on sweet corn at the Agricultural College, Winnipeg.

Que.- Rust was collected at Abbotsford, Waterville, and Ste. Anne de la Pocatière.

P.E.I.- A trace of rust was found on Golden Bantam in Queens county. Rust is not common in the province.

DRY ROT - Diplodia Zeae (Schw.) Lév.

Sask.- Three corn plants, stunted and prematurely bleached, were noted in the University plots, Saskatoon. Pycnidia of this pathogen were found at the base of one of these plants. No ears were formed. This is the first time this disease has been observed in Saskatchewan.

BACTERIAL STALK and EAR ROT

Alta.- This disease was severe in gardens at Edmonton, following a wet, cool period in early August. Infection presumably takes place from the soil as the decay first appears in the root. The disease then spreads to the stalk, leaves, ear and tassel. It resembles the disease described by H. R. Rosen (Ark. Agr. Exp. Sta. Bull. 209, 1926). The rot was also observed at Wetaskiwin, Lacombe and Olds. The causal organism has not been definitely determined.

BROWNING ROOT ROT - Asterocystis radialis Willd.

Sask.- Asterocystis radialis was observed for the first time in corn plants from the field, when it was collected at Saskatoon. (T.C. Vanterpool).

FLAX

WILT - Fusarium Lini Bolley

Sask.- A trace of wilt was found in 2 fields out of 5 examined. In the experimental plots at Saskatoon, Crown was badly diseased, while Bison was resistant to wilt.

Man.- Wilt was found in 2 fields, infection being light and moderate respectively.

RUST - Melampsora Lini (Pers.) Desm.

Man.- A trace of rust was found in 3 fields.

HEAT CANCER - Non-parasitic

Sask.- At the Experimental Farm, Indian Head, 10 per cent of the plants were affected with heat cancer in varieties Long-stem, Bison, Buda, Linota, Premost and Crown, while there were only a few dead plants in Novelty.

MANGEL

SOFT ROT - Botrytis sp.

Que.- About 15 per cent of the roots were affected with a storage rot due to a Botrytis at the Experimental Farm, Ste. Anne de la Pocatière.

DRY HEART ROT - Non-parasitic

B.C.- This disease affected a large percentage of the roots in one part of a field at Summerland.

SUNFLOWER

WILT - Sclerotinia Sclerotiorum (Lib.) de Bary

Alta.- Wilt was observed in 3 fields, but most stands were apparently free. It caused 10 per cent damage in one field at Strathmore.

N.B.- The disease was severe in a garden patch in York county. The damage was 50 per cent.

N.S.- Affected plants were found in only 3 fields. Up to 20 per cent of heads were diseased in the pure line selections at Kentville in October.

RUST - Puccinia Helianthi Schw.

Que.- A light infection of rust was observed in one field in Kamouraska county.

LEAF SPOT - Septoria Helianthi Ell. & Ev.

N.S.- Twenty-five to seventy per cent of the foliage was severely affected in fields in Kings and Cumberland counties. In one field the leaves were practically all wilted or dead.

CULTIVATED GRASSES

AWNLESS BROME (Bromus inermis)

Leaf spot (Septoria bromigena Sacc.) was fairly common in Alberta, heavy infections sometimes being present. In Saskatchewan, the disease was observed only once.

Scald (Rhynchosporium Secalis (Oud.) Davis) was rather common and often severe in Alberta.

Ergot (Claviceps purpurea (Fr.) Tul.) occurs frequently and is sometimes severe in Alberta. It was found this year in zones 9 to 11. A heavy infection of ergot was reported in one field in Manitoba.

A leaf spot, apparently caused by bacteria, was found in a field in Alberta. Bacteria were abundant in the exudate formed on many of the spots.

BROOM MILLET (Panicum mileaceum)

Smut (Sorosporium Panici-mileacei (Pers.) Takah.) was prevalent in one field of broom millet in Manitoba.

TIMOTHY

Stem rust (Puccinia graminis Pers. var. Phlei-pratensis (Erikss. & Henn.) Stakm. & Piemeisel) was general on Vancouver island, B.C.

Rust was common in Alberta; slight to severe infections were found in zones 9 and 10.

A slight infection was present on late plants in Kings county, N.S.

Slight to moderate infections were observed on both cultivated strains and wild plants in Queens county, P.E.I. The damage was insignificant.

Ergot (Claviceps purpurea (Fr.) Tul.) was found at Hobbema and Lacombe, Alta.

Leaf Spot (Heterosporium Phlei Gregory) was reported as general on Vancouver island.

WESTERN RYE GRASS (Agropyron tenerum)

Ergot (Claviceps purpurea (Fr.) Tul.) was noticed occasionally in zones 9 and 10, in Alberta.

Smut (Ustilago bromovora (Tul.) Fisch.) caused severe damage in some cultivated stands in Alberta. The three highest infections were: Strathmore, 90 per cent; Vermillion, 50; and Lacombe, 25. Smut was found occasionally on the wild grass in zones 4, 6, 9 and 10.

This smut was sent in for identification from Robinhood, Sask. The severity of the infection was not reported.

Dying-off (Cause unknown). Seed was sown in rows in the University plots, Saskatoon, Sask. in 1930 and growth began well the next spring, but by May 29 a large portion of the rows were dead. Such severe damage has not been noticed previously. (T. C. Vanterpool).

LAWN GRASSES

Snow Mould (Cause unknown) was observed forming patches on the lawns in the University campus and in the City gardens, Saskatoon, Sask. The damage was slight. The injury appears to be similar to what was common around Montreal, Que., in the springs of 1926 to 1928. However, the Typhula-like sclerotia (0.5 to 1 mm. in diam.) were not found at Saskatoon, while they were common at Montreal. (T.C. Vanterpool).

III. DISEASES OF VEGETABLE AND FIELD CROPS

ASPARAGUS

RUST - Puccinia Asparagi DC.

Sask.- A heavy telial infection of rust was present on a few rows in the University garden, Saskatoon. The damage was slight.

Ont.- Rust was heavy on two-year-old plants in a garden in York county. The stems were severely rusted. A slight general infection was observed earlier in Lincoln county.

P.E.I.- A trace of rust was found in Queens county.

BEAN

MOSAIC - Virus

B.C.- All varieties of beans, including lima, soy, pole, and wax beans, under test at the Experimental Station, Summerland, were affected with mosaic, infection being 100 per cent in most varieties. Infections varying from 5 to 6 per cent were found in several fields in Yale county.

Alta.- Mosaic occurred in the experimental plots at Olds and Lacombe and in gardens at and near Edmonton. The damage usually varied from a trace to light.

Man.- Mosaic was severe in one garden examined.

Ont.- One to two per cent of the plants were affected with mosaic in a field in Lincoln county.

Que.- At Macdonald College, mosaic varied from a trace to 30 per cent according to the variety. It caused moderate damage in some varieties. Roger's Stringless Green Pod showed the highest infection.

N.B.- Two per cent of mosaic was present in the rod rows at the Experimental Station, Fredericton.

P.E.I.- Mosaic is present each year on the Island. Two per cent of mosaic was observed in a garden in Queens county.

ANTHRACNOSE - Colletotrichum Lindemuthianum (Sacc. & Magn.) Bri. & Cav.

B.C.- Anthracnose was severe at Courtenay.

Alta.- Light infections of anthracnose were noted at Edmonton and Lacombe.

Ont.- The crop was practically free from anthracnose in Wellington county. Not over 3 per cent of the plants were affected in any field.

Que.- A light infection of anthracnose was reported from two fields in Samouraska county.

N.B.- Eighty per cent of the seed in a sample submitted for examination showed anthracnose lesions. The disease was fairly common, but the damage was slight.

N.S.- Seventy per cent of the crop was destroyed by anthracnose in Caledonia Tp., Queens Co. The crop yield was estimated originally as equivalent to 10,000 cases of canned string beans.

P.E.I.- Anthracnose caused moderate damage in gardens this year.

BACTERIAL BLIGHT - Pseudomonas Phaseoli E.F.Sm.

Alta.- Bacterial blight was a very common disease of beans in zones 9 and 10. Severe damage was reported from Brooks; some damage also occurred at Edmonton and elsewhere.

Sask.- Bacterial blight was reported only at Rosthern in the experimental garden. The varieties showed marked differences in susceptibility: The Prince, and Princess of Artois, 25 per cent infection; Early Red Valentine, 50; Full Measure, and Refugee, 66; Stringless Green Pod, 75; Masterpiece, 100.

Que.- Infection by bacterial blight varied from slight to 100 per cent according to the variety in the test plot at Macdonald College. The damage was severe where the infection was heavy. Stringless Green Pod was one of the most heavily infected. A slight infection was also present at the Experimental Farm, Ste. Anne de la Pocatière and in Missisquoi county.

N.S.- Bacterial blight caused severe leaf infection in only a few spots in fields in Caledonia Tp., Queens Co. The damage was very slight.

P.E.I.- A slight infection of bacterial blight was found in one garden in Queens county.

STEM ROT - Rhizoctonia sp.

Alta.- Stem rot was common and often severe on seedlings in Edmonton gardens.

WILT - Sclerotinia Sclerotiorum (Lib.) de Bary

Alta.- Wilt caused severe damage in three gardens at Edmonton. All parts of the plant were attacked.

RUST - Uromyces appendiculatus (Pers.) Lév.

N.S.- Traces of rust were found on several varieties at Kentville.

LEAF SPOT - Phyllosticta phaseolina Sacc.

B.C.- This leaf spot was general on Vancouver island. The damage was slight.

BROAD BEAN**STEM and POD CANCER - Sclerotinia Sclerotiorum (Lib.) de Bary**

Alta.- Stalks and pods were found affected with a black, dry rot at Edmonton. Sclerotinia Sclerotiorum was isolated from the lesions.

BEET**BLACK LEG - Phoma Betae (Oud.) Frank**

B.C.- Black leg was general on Vancouver island and in the lower Fraser valley. The damage was severe in isolated places.

Alta.- Black leg was observed in several gardens at Edmonton and at the Experimental Station, Iacombe.

P.E.I.- This disease caused slight damage in Queens county.

SCAB - Actinomyces scabies (Thaxt.) Güssow

Alta.- Moderate infections of scab were found in gardens at Edmonton.

Que.- Severe infections of scab were reported on beets planted in infected soil at Pont Rouge and St. Raymond.

N.B.- Scab caused a slight infection in a garden patch in Victoria county.

P.E.I.- A slight infection of scab was present in one garden in Queens county.

SEEDLING BLIGHT - Fusarium sp.

B.C.- The disease was general on Vancouver island and in the lower Fraser valley.

DAMPING OFF and ROOT ROT - Pythium de Baryanum Hesse

B.C.- Damping off was general on Vancouver island. The damage was severe in some places.

CABBAGE

CLUB ROOT - Plasmodiophora Brassicae Woron.

B.C.- Club root was serious on Vancouver island. The disease was also destructive on Danish Ballhead at Armstrong. Infection varied from 70 to 100 per cent; the damage was severe in some fields and the crop was a total loss in others.

Que.- Club root destroyed 80 to 85 per cent of the crop in two fields, whose area was 1/3 and one acre respectively, in Laval county. The smaller field was planted with Chinese cabbage.

N.B.- The disease was general throughout the province. Two per cent of the plants were affected at the Experimental Station, Fredericton.

P.E.I.- Only a trace of club root was recorded in the field. Seedlings of Copenhagen Market affected with the disease, were received from Summerside. The disease was not important this year.

BLACK ROT - Pseudomonas campestris (Pamm.) E.F.Sm.

Que.- Fifteen per cent of the plants were affected with black rot in one field in L'Islet county.

P.E.I.- A trace of black rot was found in a garden in Queens county.

SOFT ROT - Bacillus carotovorus L.R. Jones

B.C.- Soft rot was widespread, but the damage was slight.

N.S.- Five per cent of the heads were destroyed by soft rot in a field of Danish Ballhead in Kings county. It was thought that the disease was more prevalent on account of the extremely wet weather experienced locally.

LEAF SPOT - Alternaria circinans (Berk. & Curt.) Bolle
 (= A. Brassicae Sacc. not Macrosporium Brassicae Berk.)
 B.C.- Alternaria leaf spot was general on Vancouver island,
 but the damage was slight.

P.E.I.- Traces of this leaf spot occurred in a garden in
 Queens county.

STEM ROT - Rhizoctonia sp.

Que.- Stem rot caused by Rhizoctonia sp. was observed on
 5 per cent of the plants in a field in I'Islet county.

YELLOW - Fusarium conglutinans Woll.

Ont.- Three per cent of the plants were affected with
 yellows in a low part of a planting in Lincoln county.

BLACK LEG - Phoma lingam (Tode) Desm.

N.B.- Black leg affected 100 per cent of the plants in a
 small garden in York county.

WHITE RUST - Cystopus candidus (Pers.) de Bary

B.C.- White rust is rare on Vancouver island.

BACTERIAL LEAF SPOT - Pseudomonas maculicola (McCull.) Stev.

Ont.- A few leaves of a cabbage showing the typical symp-
 toms of bacterial leaf spot were sent to the Laboratory for
 identification. The correspondent reported that the disease
 "seems to be all through right to the inner leaves. In some
 places in the cabbage it was hardly seen and in other places
 it is very dense". Where the cabbage was grown was not stated.

CANTALOUPE

INTERNAL BREAKDOWN - Non-parasitic

B.C.- Internal breakdown was found in the three varieties
 being grown commercially: Hales Best, Hearts of Gold, and
 Superfecto. This premature breakdown has become so serious
 in the last two years that it has attracted a great deal of
 attention among both growers and shippers. Some shippers are
 of the opinion that if the disease continues to be as prevalent
 as it is at the present time, cantaloupes cannot be considered
 as a suitable crop for the southern part of the Okanagan valley.

MOSAIC - Virus

Ont.- Only an occasional plant affected with mosaic was found in a field in Welland county.

CARROT

SCLEROTINIA ROT - Sclerotinia Sclerotiorum (Lib.) de Bary

Alta.- Sclerotinia rot frequently caused moderate to severe losses in storage in the Edmonton district. In one field 75 per cent of a heavy crop was diseased, 50 per cent of which was unfit for harvest. In addition, 25 per cent of the harvested crop is rotting in storage in spite of treatment with standard formalin solution for four hours.

Que.- Eighty per cent of the crop was affected with Sclerotinia rot in a cellar at Ste. Anne de la Pocatière on Oct. 30. The cellar was very damp and poorly ventilated.

CAULIFLOWER

CLUB ROOT - Plasmodiophora Brassicae Woron.

Que.- Club root destroyed 80 to 85 per cent of the crop in a field of 2/3 acre in Laval county.

P.E.I.- One per cent of the plants were infected and destroyed by club root in a field in Queens county.

WHITE RUST - Cystopus candidus (Pers.) de Bary

Alta.- White rust was reported from Elnora.

SOFT ROT - Bacillus carotovorus L.R. Jones

B.C.- A slight amount of soft rot was present on Vancouver island.

CELERY

LATE BLIGHT - Septoria Apii Chester

B.C.- Late blight was general on Vancouver island and caused moderate damage.

Ont.- Late blight was prevalent on all varieties in Lincoln county. It was more severe this year than for some time past; the damage was moderate to severe, many growers suffering considerable financial loss. In some of these fields the causal

organism was reported as S. Apii var. graveolentis Dorogin.
Late blight caused moderate damage in Norfolk county.

Que.- Late blight was moderate to severe in the plots at Ste. Anne de la Pocatière, while it caused severe damage at St. Martin. Material was collected for microscopic examination. In the Ste. Anne collection the pycnidia were borne on the leaf blades, in well defined spots with usually a paler centre. The petioles appeared to be free from infection. The spores measured 17-30 x 1.5-2.5 μ , with 1 to 3 septa. The causal organism was identified as Septoria Apii Chester (Bull. Torr. Bot. Club 18: 373. 1891) although he gives the spore size as 25-40 x 2-2.5 μ .

In the St. Martin collection the spots were of two types: one typical of S. Apii and a second similar to that reported recently by Cochran (Two Septorias as a cause of late blight on celery. Abstr. Phytopath. 21:115. 1931) in the United States and caused, according to him, by S. Apii var. graveolentis Dorogin. The latter spot is very indefinite, irregular, brown, shading imperceptibly into the leaf. On some leaves where the healthy tissue was turning yellow the affected portions were still a deep green. The pycnidia were numerous on these spots. In addition lesions bearing pycnidia were present on the petioles. Spore measurements were: S. Apii 22.5-45 x 2-2.5 μ , with 1 to 4 septa; S. Apii var. graveolentis, 33-54 x 2-3 μ , with 1 to 3 septa. If infection studies with pure cultures prove the correctness of Cochran's assertions, these two fungi occur in Canada (H.N. Racicot & A. S. Hill).

N.B.- Late blight was common in York county, but the damage was slight.

P.E.I.- This disease was reported from several gardens in Queens county. Traces of the disease were present on several varieties at Charlottetown.

YELLOW - Fusarium sp.

B.C.- Twenty-five to 50 per cent of the plants were affected in a field of Golden Plume at Armstrong. The affected plants were worthless.

BLACK HEART - Cause unknown

Ont.- Slight infections of black heart occurred in early varieties in Lincoln county. This disease was more prevalent than last year. Paris Golden is the most seriously affected of all varieties, although the others become diseased to some extent. The disease is most severe in plants which are set out early.

SOFT ROT - Bacillus carotovorus L.R. Jones

B.C.- A small amount of soft rot occurred on Vancouver island.

Ont.- One half of one per cent of the plants were affected with soft rot in a field in Lincoln county.

CUCUMBERSCAB - Cladosporium cucumerinum Ell. & Arth.

Que.- A trace to a slight amount of scab occurred on the crop, which had been left unharvested in three fields, two in Laval county and one in Sherbrooke. It caused, therefore, no financial loss.

N.B.- Scab was common throughout the province. In one field 80 per cent of the fruit was infected and the damage was severe.

BACTERIAL WILT - Bacillus tracheiphilus E.F.Sm.

Ont.- Bacterial wilt was found on several farms in Lincoln county. In one field 3 per cent of the plants were infected.

MOSAIC - Virus

Man.- Mosaic was not common in 1931 at Winnipeg.

Ont.- One per cent of the plants were diseased in a field in Lincoln county.

P.E.I.- Traces of mosaic were found in several gardens in Queens county.

ANGULAR LEAF SPOT - Pseudomonas lachrymans (Sm. & Bryan) Carsner

N.B.- Angular leaf spot caused severe damage on the plots at the Experimental Farm, Fredericton.

EGG PLANTWILT - Verticillium sp.

Ont.- Ten per cent of the plants were affected with wilt on July 29 in a three acre patch of New York Purple in Welland county;

about two per cent of the infected plants had entirely wilted and the remainder showed signs of the disease.

EARLY BLIGHT - Alternaria sp.

Que.- This disease was common on the lower leaves in a planting at Ste. Dorothee. Although the spots were typical of early blight it was found that the spores were too small for Alternaria Solani and that they corresponded more closely to those of A. fasciculata, being even a little small for the latter species. The spores measured 9-16.5 x 37.5-67u.

GINSENG

STEM ROT - Corticium Solani (Prill. & Del.) Bourd. & Galz.
(Rhizoctonia Solani Kühn)

B.C.- Stem rot was general on Vancouver island; the damage was severe.

DAMPING-OFF - Cause undetermined

Ont.- Three to 5 per cent of the plants were destroyed by damping-off in a 1/4 acre field of seedling ginseng.

HOP

DOWNY MILDEW - Pseudoperonospora Humuli (Miyabe & Tak.) Wilson

B.C.- Downy mildew was general in the lower Fraser valley. The damage was severe.

JERUSALEM ARTICHOKE

SCLEROTINIA ROT - Sclerotinia Sclerotiorum (Lib.) de Bary

B.C.- Sclerotinia rot was rare on Vancouver island. The damage was slight.

LETTUCE

DROP - Sclerotinia Sclerotiorum (Lib.) de Bary

Que.- A trace of lettuce drop was present in Kamouraska county.

DOWNY MILDEW - Bremia Lactucae Regel

B.C.- Downy mildew was found in one field at Victoria. The damage was severe.

RHIZOCTONIA - Corticium Solani (Prill. & Del.) Bourd. & Galz.
(Rhizoctonia Solani Kühn)

Alta.- Rhizoctonia apparently rotted entire rows of head lettuce in a garden at Edmonton. The damage was severe also in the experimental plots at Lacombe.

ROOT ROT - Botrytis sp.

Ont.- Root rot destroyed 15 per cent of the plants in a plot of early lettuce transplanted from plots in the greenhouse to the field. Infection apparently originated from the greenhouse soil, which was transferred to the field with the plants. Isolations made from the diseased roots yielded a Botrytis.

MUSHROOM

BUBBLES - Mycogone perniciosa Magn.

Sask.- One crop was completely destroyed by bubbles disease in a commercial mushroom house at Saskatoon. The loss probably amounted to several hundred dollars. The causal fungus was not definitely determined, but the symptoms were characteristic of the disease (P.M. Simmonds).

Ont.- Bubbles disease was destructive in the mushroom houses of one commercial grower in Toronto.

ONION

NECK ROT - Botrytis Allii Munn

Man.- Specimens showing neck rot were received from Winnipeg. Although the symptoms were not typical for Botrytis Allii, cultures of the sclerotia yielded only this species.

BULB ROT - Fusarium sp.

B.C.- One to two per cent of the plants were found affected with bulb rot in a field of Danvers Yellow Globe at Kelowna, as early as June 9. Onions were not grown on this land in the previous three years. Before that time the land was cropped to onions continuously and considerable rot was present. A small amount of bulb rot was present on Vancouver island.

MOSAIC - Virus

B.C.- A single plant apparently affected with mosaic was found at Kelowna. One leaf was yellow with a green streak along

a rib and another leaf was green, but yellow streaks were present between the mid-ribs (G.E. Woolliams).

SMUDGE - Colletotrichum circinans (Berk.) Vogl.

Man.- Smudge was heavy on a number of small white onions sent in for examination from Winnipeg.

PARSLEY

YELLOW S - Virus

N.B.- A few specimens of parsley affected with yellows were collected in a garden in York county.

PEA

POWDERY MILDEW - Erysiphe Polygoni DC.

Alta.- Powdery mildew was common late in the season in many gardens. It is probably of little importance.

P.E.I.- Powdery mildew caused moderate to severe damage to Thomas Laxton and American Wonder peas in a garden in Queens county.

ROOT ROT - Fusarium spp.

B.C.- Patches of plants were dead in the hollow places and on the lower levels of a field of Laxton peas at Sea Island, near Vancouver. The roots were diseased and rotting. Cultures yielded a Fusarium; no evidence of Aphanomyces or Pythium were found. About 5 per cent of the total area of the field was affected; the soil was clay (J.W. Eastham).

Alta.- Root rot caused a trace to slight damage in most of the fields examined.

LEAF and POD SPOT - Ascochyta Pisi Lib.

Alta.- Peas were severely damaged by leaf and pod spot in gardens at Edmonton. The second crop in one garden was a failure; the pods, stems, and leaves were severely blighted.

Sask.- A light infection occurred on the pods of field peas at the Experimental Station, Rosthern.

Que.- Leaf and pod spot was very severe on Tall Telephone peas in many fields in Gaspé county. Infection varied from 5 to 100 per cent. High humidities, cool summers, and lack of

sunlight are perhaps all contributing factors to the high infections of A. Pisi in this district (J.G. Coulson).

N.B.- This disease was severe in a garden in York county.

P.E.I.- Leaf and pod spot is fairly common in the gardens in Queens county, but the damage is slight as the crop is usually gathered before the disease becomes injurious.

DOWNY MILDEW - Peronospora Viciae (Berk.) de Bary

B.C.- Downy mildew was present on Laxton and Surprise peas grown for canning at Sea Island. The injury was apparently negligible.

PEPPER

BLOSSOM-END ROT - Cause unknown

Man.- Blossom-end rot was common and rather destructive at Winnipeg.

MOSAIC - Virus

Ont.- Three to 5 per cent of the plants were distinctly dwarfed by mosaic in Halton county.

POTATO

In addition to the reports on potato diseases received from the separate provinces, Mr. Tucker, Chief Potato Inspector, has had summarized the prevalence of disease in fields of potatoes inspected for certification throughout the Dominion. These fields were grown from certified seed. Of the fields inspected 2,176 or 19.3 per cent failed to pass inspection on account of disease, etc. Of the fields rejected on account of disease, mosaic continues to be the most important, 39.8 per cent of the rejections being due to this disease. The percentages of rejections due to other diseases were as follows: Black leg, 7.6 per cent; leaf roll, 3.6; adjacent to diseased fields, 10.5.

The percentage of fields rejected on account of disease has steadily fallen. Last year 24.8 per cent were rejected compared with 19.3 per cent this year.

The percentage of disease found in fields inspected for certification has also declined at a fairly uniform rate. Table 1 gives the average percentage of black leg, leaf roll and mosaic

in the fields inspected during the past ten years.

Table 1.- Percentage of the three most important diseases in fields inspected for certification, 1922-1931.

Year	Number of fields inspected	Average percentage of disease found		
		Black Leg	Leaf Roll	Mosaic
		per cent	per cent	per cent
1922	3283	1.20	0.67	4.50
1923	2914	.62	.44	2.85
1924	5586	.50	.30	1.80
1925	4542	.65	.16	1.66
1926	4212	.37	.14	1.16
1927	8388	.35	.07	.79
1928	9610	.26	.11	.78
1929	8841	.21	.08	.91
1930	9707	.16	.28	.76
1931	11309	.12	.12	.54

The figures show how effective seed certification has been in controlling diseases carried in or on the "seed". Mosaic, the most stubborn disease to eliminate, has been reduced from 4.50 per cent in all fields in 1922, at which time the seed inspection service had been in operation 7 years, to 0.54 per cent in the present year. These figures are all the more remarkable as mosaic, leaf roll, and other diseases controlled by rigid selection of disease-free stock by inspection and certification are often very prevalent in the ordinary fields and where only small amounts of these diseases are present the fields were planted with seed, which was third or fourth generation seed from certified stock.

LATE BLIGHT - Phytophthora infestans (Mont.) de Bary

B.C.- Late blight was found only in the lower Fraser valley. The damage was slight.

Que.- Late blight was destructive in many fields and caused severe tuber rot in storage in some parts of Quebec. Of the fields inspected for certification, about 20 per cent were rejected on account of late blight. Some fields near Chicoutimi were completely destroyed. The disease was also reported from Cap Rouge, Drummondville, and St. Hyacinthe.

N.B.- This disease was severe in two counties, but in the rest of the province only a small amount was present.

N.S.- Late blight was observed in Colchester, Cumberland, Pictou, Antigonish, and Halifax counties, on late-planted Irish Cobbler and late varieties such as Garnet Chili and Green Mountain. As the disease appeared late in the season, the plants remained partly green until frost. Much rot, however, appeared in storage as the following figures show: non-sprayed crops, 15 to 20 per cent; partly sprayed crops, 5 to 10 per cent; and well-sprayed, 0 to 2 per cent.

P.E.I.- Late blight was first observed on August 1, in Queens county. The disease became general by Sept. 1 throughout the province, causing heavy losses in all commercial varieties, where the fields were imperfectly sprayed. Abundant rain and cloudy days accompanied the outbreak.

RHIZOCTONIA - Corticium Solani (Prill. & Del.) Bourd. & Galz.
(Rhizoctonia Solani Kühn)

B.C.- Rhizoctonia caused severe damage on Vancouver island and in the lower Fraser valley. It was most severe on Irish Cobbler. The disease was also severe in the Rutland district, Kelowna.

Que.- In a $1\frac{1}{2}$ acre field in Gaspé county, 65 per cent of the plants were severely infected; many plants showing aerial tubers. At least 20 per cent of the plants were missing.

N.S.- Rhizoctonia varied greatly in severity in different fields. From counts made during tuber inspection, infection was found to vary from 0 to 23 per cent, averaging 5.4 per cent.

P.E.I.- A light infection of rhizoctonia was reported from Kings county.

COMMON SCAB - Actinomyces scabies (Thaxt.) Güssow

B.C.- Scab was present on Vancouver island and in the lower Fraser valley. The damage was slight.

N.B.- Scab was quite severe in a few localities and moderate infections occurred over the province.

N.S.- Scab was reported from eight counties in Nova Scotia, being present mostly on Irish Cobbler. Counts made during tuber inspection gave infections varying from 0 to 40 per cent, average 3.2 per cent. The heaviest infestations were found on Cobbler in Kings and Cumberland counties.

P.E.I.- Scab caused slight to severe damage to Irish Cobbler and Green Mountain throughout the province.

BLACK LEG - Bacillus phytophthorus Appel

B.C.- Black leg caused slight damage on Vancouver island and in the lower Fraser valley.

Sask.- One field of potatoes was rejected on account of black leg. The average percentage of the disease in 78 fields inspected for certification was 0.03 per cent.

Man.- The average percentage of black leg in 133 fields inspected was 0.32 per cent, five fields being rejected on account of the disease.

N.B.- Black leg was prevalent throughout the province, but the damage was slight.

P.E.I.- Black leg caused slight damage throughout the Island.

EARLY BLIGHT - Alternaria Solani (Ell. & Mart.) Jones & Grout

B.C.- Early blight caused slight damage on Vancouver island and in the lower Fraser valley.

Man.- Very little early blight was present in Manitoba and eastern Saskatchewan in 1931.

N.S.- Infection by early blight was general in Kings, Hants, Colchester, and Annapolis counties; it was most severe on Irish Cobbler. In many fields it caused a sudden collapse of the plants, resulting in a loss of 25 to 30 per cent of the crop.

P.E.I.- Early blight was very destructive especially on early varieties in Queens and Kings counties, causing the early death of the plants. In consequence the yields were materially reduced.

VIOLET ROOT ROT - Rhizoctonia Crocorum (Pers.) DC.

Sask.- Potatoes distinctly affected with violet root rot were found in a small garden near Prince Albert. The diseased potatoes occurred in two spots only, the rest of the garden being free of disease. The garden was a piece of new breaking, which had only been cleared of willow, rose bushes and poplar stumps. The seed had been obtained by the grower from a

neighbour, who had been growing the same stock for three years. The neighbour's potatoes were free from the disease and at no time had he had any trouble of this nature. Very few, if any, potatoes are imported into the Prince Albert district as the local stock is sufficient to supply the demand. It would, therefore, appear that the infection was of local origin. The disease was identified by Dr. H.T. Güssow (J.H. Marritt). (See discussion under alfalfa violet root rot).

LEAF ROLL - Virus

B.C.- Leaf roll was general on Vancouver island and in the lower Fraser valley. The damage was slight. The disease was also observed in the Rutland district, Kelowna.

Sask.- The percentage of leaf roll present was as follows: in 78 fields inspected for certification, 0.03 per cent; in 75 fields passed, 0.02; in 3 fields rejected, 0.4.

Man.- Leaf roll was present as follows: in 133 fields inspected, 0.3 per cent; in 116 fields passed, 0.1; in 17 fields rejected, 1.03. Four fields were rejected on account of leaf roll.

N.B.- A small percentage of leaf roll was found in each county.

P.E.I.- Leaf roll caused slight damage in P.E.I.

MOSAIC - Virus

B.C.- Mosaic was general on Vancouver island and in the lower Fraser valley. The damage was slight. The disease was also present at Kelowna.

Sask.- The merest trace of mosaic was present in fields inspected for certification.

Man.- Three fields were rejected on account of mosaic out of 133 fields inspected for certification.

N.B.- Mosaic was general throughout the potato section of the province.

P.E.I.- Mosaic caused slight to moderate damage on Bliss Triumph and Green Mountain.

WITCHES' BROOM - Virus

B.C.- Witches' broom was severe in a few fields in the lower Fraser valley.

Sask.- Four plants were found affected with what appeared to be witches' broom in a large plot at the University, Saskatoon,

Man.- A single plant affected with witches' broom was found in a $\frac{1}{2}$ acre plot of Early Ohio.

N.B.- Witches' broom was found in fields planted with imported seed.

P.E.I.- One per cent of the plants were affected with witches' broom in a garden at the Experimental Farm, Charlottetown.

SPINDLE TUBER - Virus

B.C.- Spindle tuber was general on Vancouver island. The damage was slight.

Man.- Spindle tuber affected 0.6 per cent of plants in a field of Irish Cobbler.

N.B.- Spindle tuber was general throughout the province.

P.E.I.- A trace of spindle tuber was found on Irish Cobbler throughout the Island.

DRY ROT - Fusarium spp.

B.C.- Dry rot caused by Fusarium spp. was general in storage on Vancouver island and in the lower Fraser valley.

P.E.I.- A trace of dry rot was already showing in storage by October in Queens county. The disease is more prevalent late in the storage period.

TIP BURN - Non-parasitic

Sask.- Tip burn caused a trace of damage in the Horticultural garden at the University and in the city gardens, Saskatoon.

FUSARIUM WILT - Fusarium oxysporum Schlecht.

B.C.- Wilt attributed to Fusarium oxysporum was present on Vancouver Island and in the lower Fraser valley. The damage was slight.

Man.- Wilt was very prevalent throughout Manitoba and eastern Saskatchewan, being present to a slight extent in practically every field. The cause was undetermined.

Que.- A wilt disease of potato was very prevalent this year in Quebec. It was first noted in Champlain county on August 3, in Temiscouata county on August 12, and by the end of the month it had been reported from almost every county. It was more severe on dry sandy soils such as are found in Champlain, Portneuf, and Temiscouata counties. Green Mountain seemed to be the most susceptible variety.

The first symptom of the disease is a sudden wilting of one or more stems and then of the whole plant. The diseased plant loses its bright green colour, but still remains green for a few days. It finally turns yellow and soon dies. The vascular tissues of the stems and roots do not show a brownish discoloration, but sometimes the tuber-bearing stolons are decayed. The disease is very virulent and spreads rapidly in widening circles and in many fields over 90 per cent of the plants were more or less uniformly affected. Potatoes growing in virgin soil or soil, which has not been planted to potatoes for 10 to 15 years, were more seriously affected than those on older soils.

On digging up a diseased plant, one or two tubers are usually found partly or wholly decayed or they may show a soft blackening at the stem or the seed end, or around the eyes. The external symptoms are similar to those of late blight rot, but when pressure is applied to the affected area, the skin gives way and the tissues are soft, yellowish white, sticky and foul smelling. Isolations made by Mr. C. Perrault from freshly collected material have yielded both bacteria and fungi. The causal organism has not been definitely determined. The weather was dry and very warm during July (B. Baribeau).

SILVER SCURF - Spondylocladium atrovirens Harz

Sask.- Silver scurf is commonly seen at seed fairs on Early Ohio and Irish Cobbler potatoes, which have been washed.

P.E.I.- A trace to a moderate infection of silver scurf was found on Irish Cobbler in October in Queens county. The damage is usually greater towards the end of the storage season.

POWDERY SCAB - Spongospora subterranea (Wallr.) Lagerh.

P.E.I.- Powdery scab affected 25 per cent of the tubers in

one lot of Bliss Triumph in Kings county. The damage was slight.

GIANT HILL - Virus

B.C.- Giant hill was general on Vancouver island. The damage was slight.

NET NECROSIS - Cause undetermined

Man.- In the 1930 crop, early varieties, such as Burpee's Early, Bovee, and Carter's Early Favourite, seemed to be more susceptible to net necrosis than others. Almost one per cent of the tubers were affected.

SEED-PIECE ROT - Cause undetermined

In the dried-out areas of Saskatchewan and Manitoba, fields showed stands of only 5 per cent of the plants, where cut sets were used, while 95 per cent of plants emerged under the same conditions, where whole sets were planted.

PHOMA ROT - Phoma tuberosa Melhus, Rosenbaum & Schultz

P.E.I.- A trace of Phoma rot was already present on Irish Cobbler in October.

BICHLORIDE INJURY

P.E.I.- Treating with bichloride of mercury severely injured 45 per cent of the sets in a lot of Irish Cobbler in Kings county. The damage was severe; the injured seed rotted and failed to produce plants.

SOFT ROT - Pythium sp.

B.C.- A soft rot caused by Pythium sp. was observed a few times during harvesting and storage of the crop on Vancouver island and in the lower Fraser valley.

LEAF SPOT - Botrytis sp.

N.B.- Severe damage was caused by this leaf spot in a 4-acre field of Bliss Triumph at the Experimental Station, Fredericton. The Botrytis appears to be weakly parasitic, following tip-burn, insect injury, etc. It fruited abundantly on affected leaves and it was the only organism on leaves showing these spots. (D.J. MacLeod)

RHUBARB

CROWN ROT - Cause undetermined

Alta.- Crown rot is common and often severe.

LEAF SPOT - Ascochyta Rhei Ell. & Ev.

Que.- The leaves of rhubarb were moderately to severely infected in a garden in Sherbrooke county. The damage was very little as the disease developed very late in the season.

P.E.I.- This leaf spot occurs generally in all gardens.

STEM ROT - Botrytis sp.

Alta.- Stem rot is fairly common in Alberta. In five gardens a moderate amount of rot was present.

LEAF SPOT - Cause undetermined

Sask.- A leaf spot, believed to be due to bacteria, was very common around Saskatoon (P.M. Simmonds).

CROWN GALL - Pseudomonas tumefaciens (E.F.Sm. & Towns.) Duggar

N.S.- A few specimens of crown gall are found each spring in one patch of rhubarb at Kentville.

LEAF SPOT - Phyllosticta straminella Bres.

Man.- A severe outbreak of this leaf spot was found in one patch.

P.E.I.- This leaf spot is fairly common, but causes no apparent damage. It was observed once this year in Queens county.

RUTABAGA

BLACK LEG - Phoma Lingam (Tode) Desm.

Que.- A single infected rutabaga was found in a field in Sherbrooke county.

ALTERNARIA LEAF SPOT - Alternaria Brassicae (Berk.) Bolle
(=A. herculea (Ell. & Mart.) J.A.Elliott)

Que.- This leaf spot was common on the older leaves in a field in Sherbrooke county.

SPINACH

DOWNY MILDEW - Peronospora effusa (Grev.) Rabh.

Ont.- Downy mildew severely affected King of Denmark spinach in a field in Lincoln county. Two other varieties, Blumingsvale and Viroflay, growing near the first were slightly affected and entirely free from mildew respectively.

BACTERIAL SOFT ROT - ?Bacillus carotovorus L.R. Jones

Alta.- About 3 per cent of the plants were killed in a garden at Edmonton.

SQUASH

BACTERIAL WILT - Bacillus tracheiphilus E.F.Sm.

Ont.- Bacterial wilt affected 3 per cent of the plants in a patch of Banana squash in Lincoln county. Hubbard squash was resistant.

SWISS CHARD

TIP BURN - Non-parasitic

B.C.- About one per cent of the plants were affected with tip burn in a varietal test plot at Summerland. The heart leaves die in the affected plants.

TOBACCO

The information reported below was compiled by Mr. T. G. Major, Tobacco Division, Ottawa.

(1) Seed-Bed

DAMPING-OFF - Pythium de Baryanum Hesse

A few cases were reported around Tillsonburg, Ont. In the Northern District of Quebec many beds were almost completely destroyed. Some damage also occurred in the Southern District.

BLACK ROOT-ROT - Thielavia basicola Zopf

Numerous cases were found in the L'Assomption-Montcalm region and an occasional instance in the Old Belt of Ontario.

SEEDBED MOULD - Pyronema confluens (Pers.) Tul.

Several cases occurred in Colchester South Tp., Essex Co., Ont. Formaldehyde (1:1000) checked the fungus but Uspulun was

not effective. Ventilation appeared to be an important factor.

BROWN ROOT-ROT (Cause unknown) The majority of the plants were affected in the Station beds at Summerland, B.C. The roots were brown in colour and root development was insufficient to sustain the plants without wilting.

SUNBURN - Considerable damage was reported in the Northern District of Quebec.

(2) Field

BLACK ROOT-ROT - Thielavia basicola Zopf

In Ontario moisture conditions were favourable to the disease but high temperatures kept it in check. Many of the fields in the Burley sections showing early season infestations recovered to a considerable extent. Much less damage occurred in Quebec, again due to the warm weather.

BROWN ROOT-ROT - Cause unknown

A few cases occurred in Quebec in fields where the tobacco had been preceded by timothy. In Ontario flue-cured tobacco grown after a 'rest crop' of fall rye showed an uneven stand in some localities.

WILDFIRE - Pseudomonas Tabacum (Wolfe & Foster) Stev.

No cases were reported in 1931 in the commercial districts. A few plants were affected at the Central Experimental Farm. The infestation was traced to a sample of seed of Nicotiana affinis.

ANGULAR LEAF-SPOT - Pseudomonas angulata (Fromme & Murray) Stev.

Minor outbreaks were reported on late crops in both Ontario and Quebec.

MOSAIC - Virus

The trouble was less prevalent in Quebec than in past years. In Ontario, particularly in the Old Belt many severe outbreaks were reported, some fields having infestations ranging up to 75 per cent. The priming varieties, Cash and White Stem Orinoco, appeared to be most seriously affected. In B.C. 48 per cent of the flue crop contained approximately 2 per cent affected plants. In the case of Burley the infestation was about 1 per cent.

FRENCHING - Considerable damage in the New Belt of Ontario and in British Columbia.

CURLY DWARF (Cause unknown) Slight injury in the Okanagan Valley, B.C.

PHYSIOLOGICAL LEAF SPOTS - In Ontario heavy local showers were followed by a breaking down of the leaf tissues.

NITROGEN STARVATION - A premature yellowing of Burley occurred on the lighter soils in the Old Belt of Ontario where less than 500 pounds per acre of low-analysis fertilizers were applied.

LIGHTNING INJURY - One case was reported in Maidstone Tp., Essex Co., Ont.

HAIL INJURY - Some 700 acres were damaged in Norfolk Co., Ont. of which 200 acres were a total loss. In Essex and Kent approximately 300 acres were affected.

FERTILIZER INJURY - In Ontario heavy applications of highly concentrated fertilizers not sufficiently mixed with the soil resulted in a stunted growth.

WIND DAMAGE - Considerable loss in the Ontario districts late in August.

(3) Curing Barns

POLE BURN - Slight damage was reported in some localities in Ontario.

TOMATO

BLOSSOM-END ROT - Non-parasitic

B.C.- Blossom-end rot was general on Vancouver island.

Alta.- The disease caused moderate damage in a garden at High Prairie.

Que.- A trace of blossom-end rot was present at the Experimental Farm, Ste. Anne de la Pocatière.

MOSAIC - Virus

B.C.- Mosaic infected $1\frac{1}{2}$ per cent of the plants growing under glass at Kelowna. About 5 per cent of the plants were affected in a field of Earliana also at Kelowna.

Ont.- Mosaic affected 10 per cent of the plants in a field of Chalk's Jewel in Lincoln county. The damage was slight.

N.B.- Mosaic is widespread in the province; infections ranged from 0 to 30 per cent.

STREAK - Virus

B.C.- Streak was general in the greenhouses on Vancouver island and caused considerable loss in some.

Sask.- Seven plants were affected with streak out of 800 to 1000 plants in the Horticultural plots at the University, Saskatoon. All the infected plants were on the outside rows. This is probably the first report of streak for Saskatchewan.

LEAF MOULD - Cladosporium fulvum Cke.

B.C.- Leaf mould occurred in some of the commercial greenhouses at Kelowna, while others were free of the disease. In the infected houses the percentage of diseased plants varied from slight to 100 per cent. Leaf mould was also general in the greenhouses on Vancouver island. The damage was severe.

Ont.- A severe infection of leaf mould was present in greenhouses near Brighton. The plants were noticeably weakened.

Que.- Leaf mould was quite common in greenhouses at Côte des Neiges, Montreal, but the infection was moderate.

EARLY BLIGHT - Alternaria Solani (Ell. & Mart.) Jones & Grout

B.C.- Early blight was general on Vancouver island, but it caused slight damage.

Ont.- Early blight infected lightly a field of Grand Rapids tomatoes in Lincoln county. The leaves were spotted, and the fruit, especially on the lower truces, was beginning to rot. A slight general infection was also present on Earliana in Welland county.

Que.- Some early blight was present on all the varieties at Ste. Anne de la Pocatière. It caused no perceptible damage. A

slight general infection was also reported from Farnham.

P.E.I.- Damage from early blight was severe in many gardens in Queens county.

LEAF SPOT - Septoria Lycopersici Speg.

Ont.- Leaf spot was severe in a field at Manotick. The loss was estimated to be 50 per cent of the crop. As the weather was dry this summer, it may have been a contributing factor in reducing yields.

Que.- A trace to slight damage was caused by leaf spot in Sherbrooke and Stanstead counties. The disease was found also at Ste. Anne de la Pocatière.

P.E.I.- A single plant was found infected with leaf spot at Charlottetown.

BREAKDOWN - Non-parasitic

B.C.- This disease was present in the southern part of the Okanagan Valley.

LATE BLIGHT - Phytophthora infestans (Mont.) de Bary

N.B.- About 2 per cent of the plants were affected with late blight in the experimental plots, Fredericton. The affected plants were severely damaged.

WESTERN YELLOW BLIGHT - Virus

B.C.- A few isolated plants affected with this disease were present in practically all tomato fields, but the loss was slight.

OEDEMA - Non-parasitic

Ont.- Oedema affected about 90 per cent of the plants in a greenhouse in Lincoln county. The plants were young. The disease caused slight curling of the leaves.

LEAF CURL - Non-parasitic

Sask.- Pronounced leaf curl was observed in two plots of staked tomatoes. The symptoms were similar to those described by Gussow (Phytopath. 11:380-383. 1911). Stepanoff (see Rev. Appl. Myc. 10:493-494. 1931) states that excessive irrigation and manuring appeared to increase the incidence of the disease. This could hardly be so in Saskatchewan as it has been extremely dry this season and the plants were not watered artificially. (I.C. Vanterpool).

WILT - Fusarium Lycopersici Sacc. and Verticillium albo-atrum Reinke & Berth.

B.C.- Wilt due to these fungi was general in greenhouses on Vancouver island. It is very destructive when conditions are favourable for the disease.

RHIZOCTONIA - Corticium Solani (Prill. & Del.) Bourd. & Galz. (Rhizoctonia Solani Kühn).

B.C.- Rhizoctonia is general on tomatoes on Vancouver island.

TURNIP

CLUB ROOT - Plasmodiophora Brassicae Woron.

Que.- Ninety per cent of the plants were affected with club root in a small field of about $\frac{1}{2}$ acre at St. Felix d'Otes.

N.B.- From 0 to 100 per cent of the plants were affected in the experimental plots, Fredericton. The damage was correspondingly slight to severe.

N.S.- Susceptible varieties were a total loss in the test plots at Kentville.

P.E.I.- Club root was very common resulting in considerable losses to the farmers. When the plants were attacked in the seedling stage, the crop was frequently a total loss. A resistant strain of Bangholm has been grown successfully in infected soil.

BROWN HEART - Non-parasitic

N.B.- Brown heart was general throughout the province. Infestation ranged from 5 to 100 per cent. All varieties were apparently affected.

WHITE SPOT - Cercospora albomaculans (Ell. & Ev.) Sacc.

N.B.- Moderate to severe infections of white spot occurred on some of the experimental plots at Fredericton.

BLACK ROT - Pseudomonas campestris (Pamm.) E.F.Sm.

N.B.- A slight infection of black rot was noted at the Experimental Station, Fredericton.

P.E.I.- A trace of black rot was found in a field of Halls Westbury in Queens county.

BACTERIAL DECAY - Cause undetermined

Man.- A grower sowed two lots of seed, both marked "Extra-Early Purple Top Milan". Many of the turnips from one lot of seed only had decayed to a slimy mass or only a hole indicated where a turnip had been. The disease caused moderate damage (G.R. Bisby).

IV. DISEASES OF FRUIT CROPS

APPLE

SCAB - Venturia inaequalis (Cke.) Wint.

B.C.- Scab is general on Vancouver island and in the lower Fraser valley.

Climatic conditions prevailing throughout the season were such that scab was severe only in the Salmon Arm district. However, losses were slight as a regular spray schedule is always carried out. In the Okanagan valley scab was not serious even where the trees were not sprayed. McIntosh and Wealthy were the most severely attacked.

The results of counts made on unsprayed trees in the Kootenay Lake district were furnished by Mr. J. W. Eastham: Granenstein, of 243 apples on entire tree, 96.7 per cent were scabby; McIntosh Red, 1219 apples, 99.3 per cent scabby; Rome Beauty, 377 apples, 93.1 per cent scabby.

Ont.- Apple scab was very prevalent in Wellington county this year. In some instances 100 per cent of the fruit and leaves were infected on unsprayed trees of susceptible varieties such as McIntosh and Baxter. In Leeds and Grenville counties scab was also very serious, 60 per cent of the fruit and leaves being infected on unsprayed trees.

In the Niagara peninsula scab was about as prevalent as in 1930. In one unsprayed orchard, 40 per cent of leaves and 30 per cent of the fruit were infected. In sprayed orchards the trees were quite free from infection. The ascospores were first discharged on May 7 in the Laboratory orchard, St. Catharines.

In Carleton county, in an orchard, where the calyx spray was delayed on account of bad weather, scab infection was as follows: McIntosh, 50 per cent on the foliage, 25 per cent on the fruit; Fameuse, 20 and 30 per cent; Wealthy, 10 per cent on the foliage; and Lobo, 25 per cent.

Que.- Scab was especially prevalent on McIntosh and Fameuse in western part of Quebec. The season was very favourable for scab development. Nearly all commercial orchards were sprayed. In 95 per cent of those orchards, where the number of sprays advised by the "Quebec Spray Service" was applied, scab infection varied from a trace to 10 per cent. In those where one or two sprays were omitted, scab ran from 10 to 50 per cent. In unsprayed orchards 100 per cent of the fruit was usually scabby.

Sepal infection was the most common and late infections were especially noticeable in orchards near the St. Lawrence river.

Perithecia were mature on April 24; following a rain, the first discharge was noticed on April 28-29; the heaviest discharge occurred on May 12-13. (F.L. Godbout)

In eastern Quebec in Kamouraska, L'Islet, and Montmagny counties, infections on the fruit of several varieties varied from one to 20 per cent.

N.B.- In the lower St. John valley scab was severe, chiefly on McIntosh and Fameuse, while in the upper St. John, infection was light.

N.S.- Heavy infections were general on fruit and leaves in Nova Scotia. Unsprayed trees in many orchards were defoliated by August. First ascospore discharge took place on May 9 and conidia were found on foliage lesions on May 25. The weather was very favourable for scab development, the early part of the season being similar to 1925. (J.F. Hockey)

P.E.I.- Scab caused slight to severe damage on McIntosh and Gravenstein in Queens county. In unsprayed orchards scab was common and destructive; in carefully sprayed orchards only traces were present.

FIRE BLIGHT - Bacillus amylovorus (Burr.) Trev.

B.C.- Fire blight was very common in many sections of the Okanagan valley on susceptible varieties such as crab, Spitzenburg, Wealthy, Jonathan, etc., but it caused no serious loss. The disease has not been recognized on Vancouver island or in the lower Fraser valley.

Man.- Fire blight was fairly destructive despite a dry spring.

Ont.- In general, fire blight caused light infections in the Niagara peninsula. A conspicuous outbreak of the disease occurred in a small orchard of Greening apples in Lincoln county. It caused general twig infection.

Que.- Fire blight was prevalent throughout the province in 1931, being more widespread than in 1930, but less severe, causing very little damage. Very few orchards were free from the disease, but most of them had only a trace. It was severe in a block of Alexander at St. Hilaire, and severe in one and moderate in another at Abbotsford; moderate in a block of Fameuse at Hemmingford; and

severe in a few small orchards of mixed varieties in eastern Quebec. Fire blight occurred almost entirely as twig infection. Blossom infection was observed only at Abbotsford and Franklin Centre. At Abbotsford it occurred in patches on three Fameuse trees; it was severe on a Queen's Choice crab; and present in moderate amounts on Alexander. At Franklin Centre it was severe on one Golden Russet, two King, and a few Fameuse trees. The varieties most severely infected were Winter Arabka, Alexander, and crab apple.

Observations made at Lennoxville on a number of varieties showed Golden White to be severely affected, Joyce moderately so, and Lawfam, Atlas, Lobo, Choata, and Niobe slightly infected.

P.E.I.- Fire blight caused slight to moderate damage to the twigs in an orchard of Golden Russet in Queens county.

BLACK ROT - Physalospora malorum Shear
(Sphaeropsis malorum Pk.)

Sask.- Black rot apparently caused the death of a few limbs in the University orchard, Saskatoon. The pycnidial stage was abundant on the twigs of certain trees. What was probably the perfect stage was present on July 28, but the perithecia were very immature.

Ont.- A scattered infection of black rot was found on Balwin apples in an orchard in Lincoln county. Although McIntosh, Wealthy, Duchess, and Greening trees were growing in the same orchard, no disease was found on them.

Que.- A trace of black rot was noticed in the experimental orchard at Ste. Anne de la Pocatière.

CORKY CORE - Physiological

B.C.- Corky core was much less severe in the Okanagan valley than last year, when it was estimated that 200,000 boxes were affected.

Ont.- Ninety per cent of fruit was worthless on account of corky core in an orchard of Talmon Sweet, Delicious, Duchess, and Northern Spy in Welland county.

DROUGHT SPOT - Physiological

B.C.- Drought spot was exceedingly severe in the Okanagan valley; its occurrence has meant the total loss of crop in many

orchards. The loss is difficult to estimate, but it certainly amounts to many thousands of boxes. It was extremely abundant on Jonathan and McIntosh Red at the Experimental Station, Melowna. It was not general at Penticton, but it is on the increase.

PHYSIOLOGICAL BREAKDOWN

Que.- A breakdown in Fameuse apples occurred in one orchard at Oka. About 90 per cent of the crop was affected. The surface of affected fruit was uneven, but the epidermis was intact and of normal colour. When cut open, the fruit showed brown spots of broken-down tissue. At first these spots were found only near the epidermis, but later in the season they were present throughout the apple, their number depending on the severity of the disorder. The first specimens collected greatly resembled the illustrations of heat injury by Brooks and Fisher (Figs. 1 and 2, Plate 1, Journ. Agr. Res. 32:1-26. 1926), except that the broken-down tissues were not so continuous nor so near the epidermis. In later collections the specimens resembled those illustrated by McAlpine (Figs. 45 and 46, Plates 9 and 10, Bitter Pit Investigations, First Report, 1911-12). As the season was hot and the precipitation below normal, the trouble may be due to a combination of drought and heat injury.

DIE-BACK - Physiological

B.C.- Die-back was not exceptionally severe in the Okanagan valley and it occurred only in those orchards that had previously been suffering from the trouble.

DIE-BACK

Sask.- Die-back was responsible for considerable damage to the trees in the University orchard, Saskatoon. It is impossible to decide whether the limbs were killed by severe winter conditions or by Cytospora sp. The pycnidia of the fungus were plentiful on the dead limbs.

RUST - Gymnosporangium clavipes Cke. & Pk.

Que.- Slight damage was caused by rust in Kamouraska county. The identification of the fungus was confirmed by Dr. G.R. Bisby (J.G. Coulson)

N.S.- In the Annapolis valley one to 2 per cent of the fruit were marked by rust.

FROST CURL

B.C.- Frost caused considerable curling of the leaves at Penticton. The injury was most severe on Jonathan.

POWDERY MILDEW - Podosphaera leucotricha (Ell. & Ev.) Salm.

B.C.- Powdery mildew was general on Vancouver island and in the lower Fraser valley. Only in isolated sections was the damage significant.

There has been a distinct increase in the prevalence of powdery mildew this season. It was present in practically every orchard in the Okanagan valley and it did considerable damage by marking the fruit in the Penticton district. In the experimental spray blocks at Summerland, 30 per cent of the apples on the unsprayed trees had to be culled out on account of surface markings. Jonathan, Wagener and Yellow Transparent were the most susceptible varieties.

N.B.- Almost 3,000 trees were all heavily infected with powdery mildew in a nursery in York county.

ANTHRACNOSE - Neofabrea malicorticis Jackson

B.C.- Anthracnose was general on Vancouver island and in the lower Fraser valley. The damage was severe and greater than in 1930.

The disease was not prevalent except in neglected orchards, or those near water or in moist locations at Salmon Arm.

CROWN ROT - Physiological

B.C.- Where control measures have not been adopted, crown rot is steadily on the increase in the Okanagan valley. The percentage of trees affected can not be stated for large areas as a survey has not been possible. In certain badly affected orchards, as high as 25 per cent of the trees were diseased. Spitz, King, Winesap and Cox Orange are very susceptible although no variety appears to be resistant.

TWIG BLIGHT - Nectria cinnabarina (Tode) Fr.

Que.- The fungus was found at Abbotsford, fruiting on the bark of a dead stump where the branch had been pruned off.

N.S.- A slight amount of twig blight was found on Ben Davis and Rome Beauty in Kings county.

SOOTY BLOTCH - Gloeodes pomigena (Schw.) Colby

N.S.- A trace of sooty blotch was seen in Kings county.

P.E.I. - A slight amount of sooty blotch was present in Queens county.

FLY SPECK - Leptothyrium Pomi (Mont. & Fr.) Sacc.

N.S. - A trace of fly speck was found in Kings county.

HEART ROT - Pleurotus areolatus

N.S.- Pleurotus areolatus has only been found on apple trees affected with heart rot in Kings county. It is not known whether the fungus is the primary cause.

EUROPEAN CANCKER - Nectria galligena Bres.

B.C.- European cancker was found at Port Alberni, V.I. It is apparently rare.

N.S.- European cancker was found in a few poorly cared for orchards of King, Nonpareil, and Wagener in Kings and Annapolis counties. The control of this cancker is apparently connected with that of the green apple bug. The disease is on the decrease.

FROG-EYE SPOT - Cause undetermined

Rather extensive observations were made on frog-eye spot at Abbotsford, Que., and Manotick, Ont. At Abbotsford, frog-eye spot was found as follows: Wealthy, 3 to 4 spots per leaf; Fameuse, 2 spots per leaf; Golden Russet, slight infection; Yellow Transparent, a trace. At Manotick, the disease was recorded as follows: Lobo, most severely affected, 5 to 6 spots per leaf on the average; Wealthy, 4-5 spots per leaf; McIntosh, slight infection; Fameuse and Melba, traces. A microscopic examination of affected leaves, collected late in the season, showed that Coniothyrium pirinum (Sacc.) Sheld. was the most abundant fungus, all varieties being affected except Lobo. The spots on the latter variety yielded Cladosporium herbarum (Pers.) Lk. only. Other fungi found fruiting on the leaves were: Phyllosticta limitata Pk., and Phyllosticta sp. Spots, which were not in fruit, were cultured and yielded the following fungi: Alternaria sp. (not A. Mali), Cladosporium sp., and 3 unidentified fungi. Neither in the sections, nor in culture has Sphaeropsis Malorum been observed, although this fungus has been shown to be the causal agent of frog-eye spot in other places. Infection experiments with the fungi isolated have not been made (H.N. Racicot & A.S. Hill).

PINK ROT - Tricothecium roseum Lk.

P.E.I.- Where apple scab was present this disease had already appeared on stored fruit by October.

SILVER LEAF - Stereum purpureum (Pers.) Fr.

Que.- A trace was found in the experimental orchard, Ste. Anne de la Pocatière.

BITTER PIT - Non-parasitic

B.C.- Bitter pit was found on large size fruit at Summerland. Wealthy was the most susceptible variety.

Que.- Five per cent of the apples were affected with bitter pit, after being put in storage at Ste. Anne de la Pocatière.

BITTER ROT - Glomerella cingulata (Stonem.) Spauld. & v. Schrenk
(Gloeosporium fructigenum Berk.)

B.C.- Bitter rot was found at Gordon Head, V.I.

Que.- A trace of bitter rot was found on several varieties in the experimental orchard, Ste. Anne de la Pocatière.

SPOT SCALD - Non-parasitic

N.S.- Spot scald developed on fruit exposed to light after being previously stored for 4 to 6 weeks. It was apparent only on fully matured fruit.

SUN SCALD - Non-parasitic

B.C.- Sun scald was most severe on old trees, which were being top worked at Penticton, Summerland, and Kelowna. It was also severe later in the season on heavily laden trees of Winter Banana, Permaine, and Wagener at Penticton.

Ont.- Sun scald disfigured 5 per cent of the fruit on Duchess and Wealthy in an orchard in Lincoln county; McIntosh was not affected.

FRUIT ROT - Botrytis cinerea Pers.

B.C.- Fruit rot due to Botrytis cinerea was found occasionally on Vancouver island. The damage was slight.

APRICOT

DROUGHT SPOT and PHYSIOLOGICAL SHOT-HOLE

B.C.- This disease was not serious in the Okanagan valley and was confined to certain orchards, where cultural conditions were poor.

BLACKBERRYORANGE RUST - Gymnoconia Peckiana (Howe) Trotter

Ont.- Five per cent of plants were affected with rust in a planting of Eldorado in Lincoln county. In another plantation also in Lincoln county, about 5 per cent of the plants were rusted. This plantation had been carefully rogued every year. The owner said he would never plant blackberries again on account of the rust. Otherwise the crop would be a good paying one. Rusted specimens were submitted for identification from Whitby.

Que.- This rust has been observed every year for the past five years in southern Quebec. It caused no commercial damage. This year a collection was made at Huntingdon.

LEAF SPOT - Mycosphaerella Rubi Roarck. (Septoria Rubi Westend.)

B.C.- Septoria leaf spot was general on Vancouver island. The damage was slight.

N.S.- Leaf spot caused slight defoliation in two plantations in Kings county.

CANE BLIGHT - Leptosphaeria Coniothyrium (Fuck.) Sacc.
(Coniothyrium Fuckelii Sacc.)

B.C.- Cane blight is general on Vancouver island and in the lower Fraser valley. The damage is slight on Himalayan, the principal commercial variety.

CROWN GALL - Pseudomonas tumefaciens (E.F.Sm. & Towns.) Duggar

B.C.- Crown gall is general on Vancouver island and in the lower Fraser valley. The damage is slight.

FRUIT ROT - Botrytis cinerea Pers.

B.C.- Fruit rot due to Botrytis does slight damage on Vancouver island and in the lower Fraser valley.

BLUEBERRY

WITCHES' BROOM - Calypsotheca Goeppertiana Kühn
(C. columnaris (Alb. & Schw.) Kühn)

N.S.- Witches' broom was found in Kings and Yarmouth counties on both wild and cultivated species. As high as 5 per cent of the plants may be affected. Apparently it is possible to find specimens over most of the western half of Nova Scotia.

LEAF RUST - Thekospora Vacciniorum Karst.

Que.- This rust was collected on cultivated plants of high bush blueberries at Pointe du Lac.

CANKER - Godronia Cassandrae Pk.

(Fusicoccum putrefaciens Shear.)

Que.- Branches of high bush blueberry were found to bear cankers near the base, on which was fruiting Fusicoccum putrefaciens Shear. This material was collected in a plantation of about 50 plants representing a dozen varieties imported from White Bog, N.J. The plants were growing in a depression in the garden, which was very sandy, but where the blueberries were located the soil contained some muck.

The plants are attacked near the base. One branch after another dries up and dies until the plant is killed. About 15 plants have died in two seasons. Dr. N. E. Stevens, Washington, D.C., confirmed the identification. This organism causes a destructive end-rot of the cranberry, but this is the first time it has been observed on the high bush blueberry. (Vaccinium corymbosum L.) (H.N. Racicot & A.S. Hill).

CHERRY

SHOT HOLE - Coccomyces hiemalis Higgins
(Cylindrosporium hiemalis Higgins)

Ont.- Shot hole was not at all common at Vineland Station.

Que.- Some shot hole was found in two orchards in Kamouraska county.

N.B.- A few trees were slightly affected with shot hole in York county.

N.S.- Shot hole caused 10 to 20 per cent defoliation in Kings county. Unsprayed trees are likely to be heavily defoliated.

P.E.I.- Both wild and cultivated cherries were heavily defoliated in Queens county.

POWDERY MILDEW - Podosphaera Oxyacanthae (Fr.) de Bary

Ont.- Powdery mildew caused slight damage to an orchard of Montmorency cherries in Lincoln county.

BROWN ROT - Sclerotinia americana (Worm.) Nort. & Ezekiel

N.S.- Blossoms, leaves, and twigs of Morillo cherries were killed by brown rot in Kings county, 20 per cent of twigs died back a distance of one to 18 inches.

BLACK KNOT - Dibotryon morbosum (Schw.) Theiss. & Syd.

Que.- Black knot was noted on cultivated cherry in L'Islet county. It was also reported from three orchards in Kamouraska county. Knot was severe on wild cherries.

YELLOW LEAF - Non-parasitic

Ont.- In an orchard of 1000 sour cherry trees at Ridgeville, the upper branches of all trees were severely defoliated. The orchard is well cultivated; the trees are underpruned.

DROUGHT SPOT and PHYSIOLOGICAL SHORT HOLE

B.C.- This disease was noted at Naramata, Penticton, and Summerland.

CURRENT

WHITE PINE BLISTER RUST - Cronartium ribicola Fischer

B.C.- White pine blister rust is general on Vancouver island and in the lower Fraser valley.

Ont.- A heavy infection of white pine blister rust occurred on a plot of black currants across the road from a stand of white pine at Vineland Station. It caused severe defoliation in a planting of Boskop in Lincoln county. Victoria proved to be more resistant. The rust also caused severe defoliation late in the season in a planting of Topsy at Manotick

Que.- This rust caused severe defoliation of the black currant bushes at Cap Rouge, only about six young leaves remained at the tip of each shoot. The rust also caused defoliation at other places as follows: Neuville, severe; Beebe, moderate. Early in the season wild Ribes were inspected for rust about Hull. Scattered infections bearing uredinia were present on all the bushes examined.

N.B.- White pine blister rust is common on both wild and cultivated Ribes throughout the province.

P.E.I.- A heavy infection of this rust was found on red currant in Queens county. It caused serious defoliation. The rust was also observed in Prince and Kings counties.

SEPTORIA LEAF SPOT - Mycosphaerella Grossulariae (Fr.) Lindau
(Septoria Ribis Desm.)

Sask.- This leaf spot developed rapidly in the University gardens, Saskatoon, from Oct.1 to 10. It appeared to cause premature defoliation.

P.E.I.- Septoria leaf spot caused some leaf drop on black currant in Queens county.

GLOEOSPORIUM LEAF SPOT - Pseudopezaza Ribis Kleb.
(Gloeosporium Ribis (Lib.) Mont. & Desm.)

Que.- Gloeosporium leaf spot caused 75 per cent defoliation in a patch of red currant in Iberville county.

P.E.I.- This leaf spot was common in Queens county, but it caused little damage.

POWDERY MILDEW - Sphaerotheca mors-uvae (Schw.) Berk. & Curt.

B.C.- Powdery mildew was general on Vancouver island.

Alta.- Powdery mildew caused severe damage to both red and black currants in a garden at Edmonton.

Sask.- The young growing tips of black currant were rather severely damaged by powdery mildew in the University garden, Saskatoon.

In a garden protected by a windbreak of trees on three sides, black and red currants were slightly damaged by powdery mildew. Perithecia were forming well on the stems.

Ont.- Powdery mildew was prevalent on black Maple currants in a plantation in Lincoln county. The damage was slight.

GOOSEBERRY

WHITE PINE BLISTER RUST - Cronartium ribicola Fischer

B.C.- White pine blister rust is general on gooseberry on Vancouver island.

Que.- A very slight infection of this rust was found on gooseberry at Cap Rouge.

GLOEOSPORIUM LEAF SPOT - Pseudopeziza Ribis Kleb.

(Gloeosporium Ribis (Lib.) Mont. & Desm.)

Que.- This leaf spot caused about 90 per cent defoliation of the cultivated American gooseberry in a garden at Itherville.

P.E.I.- Traces of Gloeosporium leaf spot were found in a garden in Queens county.

CLUSTER CUP RUST - Puccinia Pringsheimiana Kleb.

B.C.- This rust was found at Seanichton. The damage was slight.

Que.- Specimens of rusted gooseberry leaves were received from Ste. Anne de la Pocatière.

N.S.- Cluster cup rust infected the leaves moderately and the fruit slightly in a plantation in Yarmouth county.

GRAPE

BLACK ROT - Guignardia Bidwellii (Ell.) Viala & Rav.

Ont.- Black rot infection varied considerably in the peninsula. In some vineyards 5 per cent of the fruit in the bunch was infected while in others only a trace was attacked. Where the vines were sprayed rot was of no importance.

DOWNY MILDEW - Plasmopara viticola (Berk. & Curt.) Berl. & de Toni

Ont.- The foliage was severely infected with downy mildew. In unsprayed vineyards considerable damage occurred on account of shelling of the fruit.

CROWN GALL - Pseudomonas tumefaciens (Sm. & Towns.) Duggar

Que.- Specimens of crown gall on grape were received for identification from Arthabaska county. The vines were of the "Beta" variety, and had been purchased from a nursery at Taylor's Falls, Minn.

LOGANBERRY

CROWN GALL - Pseudomonas tumefaciens (Sm. & Towns.) Duggar
 B.C.- Crown gall was general on Vancouver island and in the lower Fraser valley. The damage was severe.

FRUIT BLIGHT - Botrytis cinerea Pers.

B.C.- Fruit blight caused severe damage on Vancouver island and in the lower Fraser valley.

CANE BLIGHT - Leptosphaera Coniothyrium (Fuck.) Sacc.
 (Coniothyrium Fuckelii Sacc.)

B.C.- Cane blight is general and very serious on Vancouver island.

SPUR BLIGHT - Didymella applanata (Niessl) Sacc.

B.C.- Spur blight was found at Saanichton. The damage was slight.

BLOSSOM BLIGHT - Cause undetermined

B.C.- Blossom blight is destructive in the Elk Lake, Royal Oak, Keating, and Saanichton districts on Vancouver island. It caused a loss of about 30 per cent of the crop. Foster (Scient. Agric. 11:529-534. 1931) reported Bacillus dessicans n. sp. as the cause of this disease. More recent study indicates that thrip injury is the primary cause, but thrips alone are unable to produce any serious damage. Besides Bacillus dessicans several other bacteria have been isolated from blighted blossoms and fruit and their pathogenicity tested. It appears that some of these organisms may be more pathogenic than Bacillus dessicans (W. Newton).

ORANGE

STEM-END ROT - Diplodia natalensis Pole-Evans

Que.- This rot is causing serious damage to oranges shipped from Jamaica. Five to 50 per cent of the fruit is affected on its arrival by boat in Montreal (J.G. Coulson).

PEACH

SCAB - Cladosporium carpophilum Thüm.

Ont.- Peach scab was less prevalent than in 1930 in the Niagara peninsula. Thirty to 40 per cent of the fruit was

infected in an unsprayed block of Rochester in Lincoln county, but only 4 per cent was severely affected. Elberta was quite free from infection.

LEAF CURL - Taphrina deformans (Berk.) Tul.

B.C.- Leaf curl was general on Vancouver island. The damage was severe.

Ont.- Leaf curl was general and quite prevalent in unsprayed orchards in the Niagara peninsula. Ten per cent or more of the leaves were affected especially on Elberta. Where the trees were sprayed, infection was very light. Infection apparently occurred about 2 weeks after the buds had opened.

POWDERY MILDEW - Sphaerotheca pannosa (Wallr.) Lév. var. Persicae Woron.

B.C.- Powdery mildew was not abundant, but it was severe on Triumph and New Haven varieties at Summerland.

BROWN ROT - Sclerotinia americana (Worm.) Nort. & Ezekiel

Ont.- A scattered infection of brown rot was present in a block of Red Bird peach in Lincoln county. The damage was slight.

BLIGHT - Coryneum Beijerinckii Oud.

B.C.- Blight is general on Vancouver island. The damage is slight.

PEAR

FIRE BLIGHT - Bacillus amylovorus (Burr.) Trev.

B.C.- Fire blight was kept fairly well in check in most districts of the Okanagan valley through the work of the Extension Service of the Provincial Department of Agriculture. In the Westbank area, however, a serious outbreak occurred and as a result several orchards were practically wiped out.

Ont.- Fire blight caused considerable twig blight and in many instances branches and limbs were also involved. In the young Barlett orchard at the Laboratory, St. Catharines, infection was severe. It also caused a moderate amount of twig blight on Flemish Beauty at Abbotsford, Que.

SCAB - Venturia pyrina Aderh.

B.C.- Scab was general on Vancouver island; the damage was severe.

Ont.- Eighty per cent of the fruit was infected and severely damaged in a block of six Flemish Beauty trees in Lincoln county. The twigs and leaves were affected moderately and slightly respectively.

N.S.- Scab was very common in Kings county, 100 per cent of the fruit being infected in several varieties.

P.E.I.- A small percentage of fruit were severely damaged in an orchard of Flemish Beauty in Queens county.

DROUGHT SPOT - Non-parasitic

B.C.- Drought spot was found on Bartlett and Flemish Beauty at Penticton. It is not very prevalent, but it is on the increase.

BLACK END ROT - Non-parasitic

B.C.- Black end rot has increased slightly in the Penticton area, but it is not of serious economic importance.

CORKY CORE - Non-parasitic

B.C.- Corky core was found on several varieties at Summerland.

DIE BACK - Non-parasitic

B.C.- A number of trees were affected with die back in an orchard at Westbank. The buds had opened and then dried up; the dead leaves remained in position. In some instances the wood was alive and new leaves had come out; in others the wood was dead and the cambium had darkened.

POWDERY MILDEW - Podosphaera leucotricha (Ell. & Ev.) Salm.

B.C.- Powdery mildew appears to be somewhat on the increase as it was reported as affecting fruit from different sections. It was found on one tree of Pyrus ussuriensis in the Laboratory grounds, Summerland. Mildew was severe on the fruit of Bartlett and Flemish Beauty at Penticton.

PLUM

BLACK KNOT - Dibotryon morbosum (Schw.) Theiss. & Syd.

Que.- Black knot was severe on plums at Ste. Famille, Isle of Orleans. It was noticed in six orchards in Kamouraska county, 5 to 75 per cent of the trees bearing knots. The disease is present on 75 per cent of the wild plum trees along the roadsides on the

islands of Montreal and Jesus. The disease is affecting the ornamental value of these trees.

N.B.- Black knot is common on wild plum throughout the province. Slight infections occur also on cultivated plum.

N.S.- Black knot was noticed in a well cared for orchard at Kentville.

P.E.I.- Black knot caused slight damage in an orchard in Queens county. The disease is becoming less troublesome in well cared for orchards.

PLUM POCKETS - Taphrina Pruni (Fuck.) Tul.

Man.- Plum pockets was almost absent at Winnipeg in 1931.

Que.- Out of ten trees, four were badly infected with plum pockets in Kamouraska county.

N.S.- Half the fruit was destroyed on some unsprayed trees in Annapolis county.

BROWN ROT - Sclerotinia americana (Worm.) Nort. & Ezekiel

B.C.- Brown rot caused slight damage on Vancouver island.

Ont.- Brown rot was more prevalent than in 1930 on stone fruits in the Niagara peninsula. No counts were made to determine the percentage of rot, but infected fruit could easily be found. Brown rot apothecia were first observed on May 4 and could be found easily on May 14.

N.S.- Up to 10 per cent of the fruit was affected by brown rot on varieties of Prunus domestica and prunes in Kings county.

P.E.I.- Brown rot was severe on one tree out of three in a garden at Charlottetown.

SHOT HOLE - Coccomyces prunophorae Higgins

(Cylindrosporium prunophorae Higgins)

B.C.- Shot hole is general on Vancouver island, but the damage is slight.

Ont.- Shot hole caused some defoliation in an orchard of prunes in Lincoln county.

Que.- A moderate infection of shot-hole was present on Damas plums at Ste. Anne de la Pocatiere.

SCAB - Cladosporium carpophilum Thüm.

Que.- Fruits sent in for examination from Frontenac county were found to be affected with scab. The owner stated that his plums had dried up just as they were ripening for the last two or three years.

BACTERIAL SPOT - Pseudomonas Pruni E.F.Sm.

Ont.- This disease was observed on two neighbouring farms in Lincoln county. On one farm the disease was very prevalent, rendering the fruit useless and causing considerable shot hole and defoliation.

GUM SPOT - Non-parasitic

B.C.- Gumming accompanied by an internal necrosis has been more serious this year than usual in plums in the Okanagan valley. The loss over the whole area is difficult to estimate, but in certain orchards approximately all the fruit was unmarketable on account of the gumming.

PLUM LUMP - Non-parasitic

B.C.- In some orchards about Summerland 100 per cent of the fruit was affected.

BLACK ROT - Physalospora malorum Shear
(Sphaeropsis malorum Pk.)

Sask.- A small amount of the imperfect stage was found on plum at Saskatoon.

DIE BACK - Valsa ambiens (Pers.) Fr.
Cytospora ambiens Sacc.

Sask.-Both stages of the fungus were found on plum. The fungus was identified by Dr. Dearness.

QUINCE

LEAF BLIGHT - Fabraea maculata Atk.
(Entomosporium maculatum Lév.)

Ont.- Leaf blight was severe on quince at Jordan in 1930.

RUST - Gymnosporangium clavipes Cke. & Pk.

N.S.- Less than one per cent of the fruit and leaves were affected in an orchard in Kings county. The trees were well sprayed with sulphur fungicides.

RASPBERRY

SPUR BLIGHT - Didymella applanata (Niessl) Sacc.

Man.- Spur blight is common and causes some injury in Manitoba.

Ont.- Traces of spur blight were found on Latham, Viking and Newman at Manotick.

N.B.- Slight to moderate infections of spur blight were noted throughout the plantations in the province.

P.E.I.- Spur blight causes heavy losses in Queens county.

MOSAIC - Virus

B.C.- Mosaic was general on Vancouver island; over 50 per cent of the plants were affected.

Alta.- Both mosaic and leaf curl, especially the former, occur in many of the raspberry plantations in the province. Sometimes the damage is severe.

Ont.- Mosaic was found to be general in plantations inspected in York, Peel, Halton, Lincoln, Wentworth, Welland, Norfolk, Elgin, Huron, and Brant counties. The disease is more prevalent in Cuthbert, Viking, and King varieties. (G.C. Chamberlain). At Manotick the following percentages of mosaic were noted: Cuthbert, 20-25 per cent; Viking (2 plantings) 3 per cent and a trace; Newman, a trace.

N.B.- Mosaic infected 20 per cent of the plants at the Experimental Station, Fredericton. The disease is common on wild raspberries throughout the province.

P.E.I.- The following percentage of infected plants were reported in Queens county: Herbert, a trace to 100 per cent; Viking, a trace only.

LEAF CURL - Virus

Ont.- Leaf curl was found scattered throughout Lincoln, Brant, Middlesex, Elgin, Halton, Welland, and York counties.

The percentages of infection were small.

N.B.- Leaf curl was common on wild and cultivated raspberries throughout the province. The damage was severe.

ANTHRACNOSE - Plectodiscella veneta Burkh.
Gloeosporium venetum Speg.

Ont.- Anthracnose was prevalent in a planting of Black Perfection in Lincoln county; the damage was slight. Fifty per cent of the canes showed a trace and 10 per cent a moderate infection in a planting of Newman at Manotick. Only a trace was present on Viking.

P.E.I.- A trace of anthracnose was found on Viking in Queens county.

SEPTORIA LEAF SPOT - Mycosphaerella Rubi Roark
(Septoria Rubi Westend.)

Ont.- Specimens of this leaf spot on Herbert were sent in for identification from Sutton West.

Que.- Septoria leaf spot heavily infected 100 per cent of leaves of Herbert in plantations at Emileville and Beebe.

CANE BLIGHT - Leptosphaeria Coniothyrium (Fuck.) Sacc.
(Coniothyrium Fuckelii Sacc.)

B.C.- Cane blight was general and severe on Vancouver island. Diseased canes of Cuthbert were received from Hatzic. The owner says "That two-thirds of the canes have rotted or nearly rotted off. In some places the whole hill has died".

Ont.- Cane blight had affected and killed two per cent of the canes in a planting of Cuthbert in Wentworth county.

Que.- A trace of cane blight was found on Adams 87 at Cap Rouge.

BLUE STRIPE WILT - Verticillium ovatum Berkeley & Jackson
and Verticillium sp. (V. Dahliae group)

Ont.- Blue stem wilt was found scattered throughout Lincoln, Wentworth, and Norfolk counties, on Viking and Cuthbert. Infection varied from 1 to 5 per cent.

N.S.- Wilt affected $1\frac{1}{2}$ per cent of the canes in a planting of Herberts in Kings county.

PUCCINIASTRUM RUST - Pucciniastrum americanum (Farl.) Arth.

Que.- About 30 per cent of the leaves were slightly to moderately affected with this rust in a planting of Viking at Abbotsford.

N.S.- Specimens of rusted leaves of cultivated raspberry were collected at Kentville in 1925. Examination of these leaves showed that they were infected with Pucciniastrum americanum. It is probable that the rust on Viking reported last year as Aehneola uredinis was this rust. (I.L. Connors and A.S. Hill)

PHRAGMIDIUM RUST - Phragmidium imitans Arth.

B.C.- This rust is general on Vancouver island and is severe in certain districts.

POWDERY MILDEW - Sphaerotheca Humuli (DC.) Burr.

Ont.- Powdery mildew was prevalent on Brighton, Count, and Latham in the Niagara peninsula; it caused some stunting of the growth. Heavy infections were also reported on Latham from Peel and Halton counties.

CROWN GALL - Pseudomonas tumefaciens (Sm. & Towns.) Duggar

Ont.- Crown gall was in general more widespread this season due possibly to the high soil temperatures and frequent showers. In a planting of Latham in Lincoln county 25 per cent of plants were affected; the damage was moderate. Many galls appeared at the surface of the ground choking and killing the affected canes.

DIE BACK - Non-parasitic

B.C.- Die back, apparently caused by a late frost was very general at Summerland, Penticton, and Naramata. There was a considerable reduction of the crop.

HAIL INJURY

Ont.- Hail that fell a week or ten days previous to Sept. 24, severely injured the canes of raspberries at Manotick. The injury had the appearance of anthracnose, except that the hail marks were confined to one side of the cane and were scattered evenly, about two to three inches apart, the whole length of the cane.

BLOSSOM BLIGHT - Cause undetermined

B.C.- Blossom blight caused severe damage to Franconia, an English variety, in certain districts on Vancouver Island.

Cuthbert is practically immune in the field.

SANDCHERRY

POWDERY MILDEW - Podosphaera Oxyacanthae (Fr.) de Bary

Sask.- A fairly heavy infection of powdery mildew was present on some of the bushes of sandcherry in the University orchard, Saskatoon, on Sept. 29. Perithecia were abundant.

DIE BACK - Valsa ambiens (Pers.) Fr.
(Cytospora ambiens Sacc.)

Sask.- A little Valsa ambiens along with Cytospora ambiens was found on sandcherry. Determinations were made by Dr. Dearness (R.C. Russell).

STRAWBERRY

LEAF SPOT - Mycosphaerella Fragariae (Schw.) Lindau
(Ramularia Tulasneii Sacc.)

Sask.- A light infection of the conidial stage was present on cultivated strawberries in the University garden, Saskatoon.

Ont.- Leaf spot was reported but caused little damage in Lincoln and Carleton counties.

Que.- Medium to heavy infections of leaf spot were reported from Western Quebec. In some cases it caused heavy defoliation and thus decreased the yield. Leaf spot was general from Quebec to Riviere du Loup, 25 to 50 per cent of the leaf surface being infected.

N.B.-Leaf spot was widespread in the province. The damage was slight.

N.S.- Leaf spot was present in Annapolis and Halifax counties; it apparently caused no damage.

P.E.I.- Leaves of Senator Dunlop were moderately infected in Queens county; the damage was practically nil.

POWDERY MILDEW - Sphaerotheca Humuli (DC.) Burr.

Ont.- Powdery mildew caused slight damage in the Niagara pen-

BLACK ROOT - Cause undetermined

Ont.- Twenty-five per cent of the plants were affected with black root on May 22 in a patch of Parson's Beauty. The old plants were dying. The young plants were as yet apparently healthy.

LEAF SCORCH - Diplocarpon Earliana (Ell. & Ev.) Wolf
(Marssonina Fragariae (Sacc.) Kleb.)

Ont.- Leaf scorch was unusually common in the district around Vineland Station.

V. DISEASES OF FOREST AND SHADE TREES

ASH (Fraxinus)

RUST - Puccinia sparganoides Ell. & Barth.

A trace of rust was found on the leaves and petioles of white ash (F. americana L.) in the Provincial Forest Nursery, Berthierville, Que. A single specimen was found on the same host in York county, N.B.

Leaves of white ash were fairly heavily infected with Piggotia Fraxini Berk. & Curt. at Berthierville.

BASSWOOD (Tilia)

POWDERY MILDEW - Uncinula Clintonii Pk.

Powdery mildew was found on basswood leaves near Farmer's Rapids, Que.

BEECH (Fagus)

ROT - Panus stipticus Fr.

Panus stipticus was very common on dying beech at Kentville, N.S.

BUTTERNUT (Juglans)

LEAF SCORCH - Marssonina Juglandis (Lib.) Magn.

Leaf scorch is general on butternut throughout Quebec. It has been observed from Ottawa to Montreal and Quebec City. It was also present east and south of Montreal throughout the Eastern Townships to Sherbrooke, Stanstead, Hemmingford, and Franklin Centre. Specimens were collected and determined from Abbotsford and St. Sulpice (H.N. Racicot).

CEDAR (Cedrus)

The current year's growth of young deodar cedars (Cedrus deodara Laws.) was found killed in a nursery at Vancouver, B. C. on July 15. The conidiophores of a Botrytis were plentiful on dead and dying shoots. The injury may affect the symmetry of growth. The previous month was exceptionally wet.

CHESTNUT (Castanea)

BLIGHT - Endothia parasitica (Hurr.) Anders. & Anders.

Stands of the native chestnut (Castanea dentata) were found severely damaged by blight in Welland, Lincoln, and Norfolk counties. Trees were being killed outright by the disease.

ELDER (Sambucus)

Leptosphaeria sambucina Ell. & Ev. was found on elder in the University nursery at Saskatoon, Sask.

ELM (Ulmus)

BLACK SPOT - Gnomonia ulmea (Schw.) Thüm.

Que.- Black spot was collected on slippery elm (Ulmus fulva Michx.) at Lennoxville. Specimens were also observed in the Provincial Forest Nursery, Berthierville. Forty to 50 per cent of the leaves were infected; on 5 per cent the infection was moderate to severe.

N.B.- A trace of black spot was present on elm in York county. Specimens were identified by Dr. Dearness.

BALSAM FIR (Abies balsamea)

WITCHES' BROOM - Melampsorella Caryophyllacearum Schroet.

N.B.- This disease is common throughout the province.

N.S.- Witches' broom was observed in Kings and Annapolis counties. It may be found in most stands of fir in western Nova Scotia.

MAPLE (Acer)

Box Elder (Acer Negundo)

One tree, whose upper limbs were seriously diseased in 1929, is now in a very stunted sickly condition at Saskatoon, Sask. The majority of the younger shoots are dead and bear abundant pycnidia of Sphaeropsis albens Ell. & Ev. (R.C. Russel).

Septoria Negundinis Ell. & Ev. and Piggotia Negundinis Ell. & Dearn. were collected on leaves at Martinville, Que.

Red Maple (Acer rubrum)

A species of Phoma was found killing the young twigs in Lincoln county.

Norway Maple (Acer platinoides)

One tree was completely defoliated as a result of being affected with wilt (Verticillium sp.)

Silver Maple (Acer saccharinum)

A trace of tar spot (Rhytisma acerinum (Pers.) Fr.) was collected at L'Assomption and Ste. Anne de la Pocatière, Que. It was reported on the same host from Queens county, P.E.I. The disease is common throughout New Brunswick, causing slight damage.

Mountain Maple (Acer spicatum)

Powdery mildew (Uncinula circinata Cke. & Pk. was collected near Farmer's Rapids, Que.

FIRETHORN (Pyracantha)SCAB - Fusicladium sp.

On a number of occasions the leaves and fruit of Pyracantha coccinea Roem. have been found covered with sooty spots, at Vancouver, B.C. A fungus was present on these spots which is indistinguishable from Fusicladium on apple or pear. The degree of infection is comparable to that of scab on Flemish Beauty pear in a bad season (J.W. Eastham).

HAWTHORN (Crataegus)FIRE BLIGHT - Bacillus amylovorus (Burr.) Trev.

P.E.I.- Fire blight caused slight damage on C. Oxyacantha var. rosea grafted on a hardy stock at Charlottetown. The disease has been practically eliminated by careful pruning.

RUST - Gymnosporangium clavariaeforme (Jacq.) DC.

P.E.I. - This rust caused slight damage to hawthorn in Queens county.

HORSECHESTNUT (Aesculus)LEAF SPOT - Phyllosticta sphaeropsoidea Ell. & Ev.

P.E.I.- This disease occurs commonly in Prince Edward Island

and frequently causes severe injury during mid-summer. Infection varied from a trace to 60 per cent of the leaf surface.

MOUNTAIN ASH (Sorbus)

FIRE BLIGHT - Bacillus amylovorus (Burr.) Trev.

P.E.I.- Fire blight causes slight to severe damage on both American and European mountain ash. Frequently the trees succumb to the disease.

OAK (Quercus)

LEAF CURL - Taphrina caerulescens (Mont. & Desm.) Tul.

Alta.- Specimens of this leaf curl were collected at Beaver-lodge. It caused moderate damage. The fungus was identified by Dr. Dearness.

HEART ROT - Polyporus sulphureus (Bull.) Fr.

N.S.- Heart rot occurs on some trees of red oak year after year at Kentville.

HEART ROT - Polyporus frondosus (Dicks.) Fr.

N.S.- Large clumps of this polypore have been growing at the bases of red oak trees for the past three years at Kentville. In one instance the side of the tree was decayed.

PINE (Pinus)

WHITE PINE BLISTER RUST - Cronartium ribicola Fischer

B.C.- White pine blister rust is evidently well established in the Kootenay Lake district on western white pine. Blister rust scouts of the United States Dept. of Agriculture collected numerous fruiting cankers along the western arm of Kootenay Lake between Nelson and Proctor.

Ont.- This rust was collected on Pinus Strobus L. var. umbraculifera Knight and P. monticola Dougl. in the Arboretum at Ottawa.

Que.- Besides Mr. Pomerleau's report on white pine blister rust (see p.105) the disease was recorded on pine as follows:-

Wychwood and Lac Beauport, specimens received.

Hull, several small pines were found infected in a pasture. One tree, two and a half inches in diameter, was affected at the base.

Deux Montagnes county, rust present for the past two years in a stand of 100,000 pines. Probably it would be worth while to eradicate the Ribes.

Chateaugay, 16 ornamental trees were nearly all dead on account of rust. The trees are 15 years old and they have been affected for at least four years.

N.B.- Only two reports were received from extensive forest areas.

N.S.- The rust is on the increase in western Nova Scotia. In a clump of trees at Kentville, 50 per cent were affected. On May 6, aecia were abundant and shedding spores.

P.E.I.- White pine blister rust caused severe damage in Queens and Prince counties. Many trees have died from rust.

BLISTER RUST - Cronartium Comandrae Pk,

B.C.- One half of one per cent of the young trees of Pinus ponderosa Dougl. were affected with this rust at Summerland. It causes the death of the young trees and is occasionally found on old ones.

Sask.- This rust was found near Macdowall, Sask. on Pinus Banksiana.

NEEDLE RUST - Coleosporium Solidaginis (Schw.) Thüm.

Sask.- The needles of Pinus Banksiana Lamb. were lightly infected near Macdowall, Sask. not far from where the rust was found last year.

NEEDLE CAST - Lophodermium pinastri (Schr.) Chev.

N.B.- Occasional infections of needle cast were noted throughout the province.

N.S.- Needle blight was very prevalent on trees along roads and in the driest parts of the woods at Waterville, Goldbrook, and Kentville. Considerable Lophodermium pinastri was present on fallen needles. It is thought that the drought of 1930 may have been an important factor in causing the death of the needles.

POPLAR (Populus)CANKER - Hypoxylon pruinaum (Klotzsch) Cke.

Sask.- This canker is common on P. tremuloides Michx. in many districts of Saskatchewan. It is distinctly parasitic and by girdling the tree causes the death of scattered individuals in the bluffs. About 5 per cent of the trees were dead or dying, apparently due to this canker, in a bluff near Saskatoon. (R.C. Russell).

Que.- A severe infection was reported from Blue Sea Lake.

LEAF SPOT - Septoria populicola Pk.

Ont.- A slight infection of this leaf spot was present on Populus Tacamahaca Mill. (P. balsamifera Duroi not L.) at Kemptville.

CANKER - Cytospora chrysosperma (Pers.) Fr.

Alta.- This canker was more common in southern Alberta than in 1930, although it was less common in the area north of Calgary. Little killing was observed.

Sask.- Cytospora chrysosperma was abundant on dying trees of Russian poplar in the University orchard, Saskatoon. It was hard to estimate the damage caused by the fungus, but it is thought to be a weak parasite, which followed injury due to drought.

SPRUCE (Picea)Needle Rust - Peridermium sp.

Ont.- Blue spruce growing in the Arboretum and about city residences, Ottawa, were heavily infected with a needle rust. The trees showing rust in the Arboretum were labelled as follows: Picea Engelmannii and its variety glauc; P. pungens and varieties argentea, glauc, Rosteri, and Rosteri glauc. No rust was found on P. Engelmannii var. argentea or on many other species of Picea growing in the Arboretum. As the pycnia are deep-seated under the epidermis it is thought that the Peridermium is connected with a species of Chrysomyxa (I.L. Connors).

P.E.I.- This needle rust caused a slight infection on blue spruce in Queens county.

Dr. Meyer-Wegelin of Hannoversch-Münden, Germany, who spent the summer in the region of Matamak, Que., reported that the surface of the water in that region was covered with a very fine

dust. On examining samples of this dust, it was found to consist exclusively of aeciospores. It is probable that these spores were those of the needle rusts of spruce, which were abundant in that region. (H.T. Güssow).

Coniophora byssoidea (Pers.) Fr. was found attacking spruce seedlings in a consignment from France. The percentage of infection was slight. The fungus was determined by Dr. L.O. Overholts (Forest Herbarium and Culture 1686).

WILLOW (Salix)

SCAB - Fusicladium saliciperdum (Ell. & Tub.) Tub.

Que.- Scab was reported from Compton and Sherbrooke counties.

N.B.- Scab was common throughout the entire province.

N.S.- Scab and black canker is rapidly destroying Salix vitellina in Nova Scotia. Ten per cent of the trees surviving from previous years were killed. The damage caused by these two diseases can not be estimated separately. (K.A. Harrison)

P.E.I.- Scab is destroying many trees in each county.

BLACK CANKER - Physalospora Miyabeana Fukushi

N.B.- Black canker is common in association with scab.

N.S.- Black canker along with scab is very serious in Nova Scotia.

CANKER - Cytospora chrysosperma (Pers.) Fr.

Alta.- Cytospora chrysosperma was plentiful on dead limbs of willow in windbreaks in Alberta.

N.S.- Cytospora chrysosperma apparently kills the twigs early in the spring but it is not active in the summer. Five per cent of the twigs were damaged on Salix babylonica at Kentville.

DIE BACK - Cytospora sp.

Sask.- Considerable die-back is present in the willow windbreaks around the University orchard, Saskatoon. A species of Cytospora is fruiting on the dead limbs.

LEAF SPOT - Gloeosporium Salicis West.

Que.- Specimens of this leaf spot were collected at Berthierville.

N.S.- This leaf spot caused some defoliation, late in the season, at Kentville.

Rhytisma salicinum (Pers.) Fr. heavily infected narrow-leaved native willows at Biggar, Sask. A moderate infection was reported on willow in Rouville county, Que.

Gloeosporium boreale Ell. & Ev. was collected at Lennoxville, Que.

Uncinula Salicis (DC.) Wint. was common in northern Saskatchewan. It was also reported from Lennoxville, Que. and Queens county, P.E.I.

VI. DISEASES OF ORNAMENTALS

ARBUTUS

LEAF SPOT - Microsphaerella arbuticola (Pk.) House

B.C.- This leaf spot was general on Vancouver island and in the lower Fraser valley. The damage was severe, but it was less than in 1930. (W. Newton)

CARAGANA

LEAF SPOT - Septoria Caraganae (Jacz.) Died.

Alta.- This leaf spot caused some leaf drop at Edmonton.

Sask.- Light to heavy infections of this leaf spot were noticed on all Caragana hedges examined in Saskatoon and at the Forestry Farm, Sutherland. It caused slight premature defoliation. As usual only mature leaves were attacked.

Man.- Leaf spot caused some defoliation at Winnipeg in 1931. This is the first report of this disease from Manitoba.

CARNATION (Dianthus Caryophyllus)

RUST - Uromyces Dianthi (Pers.) Niessl

B.C.- Rust was general on Vancouver island; the damage was slight.

CHINA ASTER (Callistephus)

YELLOWS - Virus

B.C.- Yellows was rare on Vancouver island. Damage was slight. The disease was also reported from Summerland.

Alta.- Yellows was often common in gardens throughout the province. The disease was often severe.

Sask.- Yellows was severe in all parts of Saskatoon. In the City Gardens, over 50 per cent of the plants were affected. All the plants were diseased in a bed 50 x 10 ft. at the University. In the Aster section of the Flower Show, there were few entries on account of the disease. It was also prevalent at Indian Head.

Man.- Yellows was severe at the Agricultural College, in Winnipeg, and elsewhere.

A good many marigolds (Calendula) turned yellow and the heads only partly developed as in aster yellows or more commonly did not properly expand at all at the Agricultural College, in Winnipeg, and other places (G.R. Bisby).

Que.- Over 90 per cent of the plants were affected with yellows in an experimental bed at Cap Rouge. The eleven varieties present were about equally infected. Tarnished plant bug may have caused some of the injury.

A single plant of Scabiosa was found affected with yellows in the same garden at Cap Rouge.

N.B.- Yellows was widespread and destructive throughout the province.

Yellows affected a number of other garden flowers at the Experimental Station, Fredericton. The following notes on infection, damage, etc. were supplied by Mr. D.J. MacLeod: Ageratum, 50 per cent affected; Calendula, all the marigolds affected and severely damaged, flowers seriously disfigured; Cape Marigold (Dimorphotheca), 100 per cent affected, damage severe; Coreopsis, 50-100 per cent affected, damage severe, yellow common in York county; Dahlia, occasionally infected, damage slight; Everlasting (Helichrysum), all varieties affected 100 per cent, damage severe; Gaillardia, severely affected; Marigold (Tagetes) all varieties affected 100 per cent, damage severe; Ice-mallow (Lavatera) 10 to 30 per cent affected, damage severe; Zinnia, 25 per cent affected, damage severe.

P.E.I.- This disease is so destructive that it is practically impossible to grow garden asters.

WILT - Fusarium conglutinans Woll. var. Callistephi Beach

B.C.- Wilt was general on Vancouver island and in the lower Fraser valley. The damage was severe. It was also reported from Summerland.

Alta.- The disease was observed at Edmonton.

Sask.- A trace of wilt was noted in the beds at the University, Saskatoon. A moderate infection was also seen in a city

garden at Saskatoon.

Ont.- Wilt was again widespread and serious in western Ontario. Some aster growers reported that 100 per cent of their plants were destroyed. In the gardens inspected, 3 to 15 per cent of the plants were infected (J.E. Howitt).

Aster wilt was general in Lincoln and York counties.

Que.- In general the light coloured varieties were most affected (up to 30 per cent) by wilt in the experimental garden at Cap Rouge. Some misses occurred in the rows, but it may have been due to cut worms.

N.B.- Wilt was general throughout the province. The damage was mild to severe.

STEM and FLOWER BLIGHT - Botrytis cinerea Pers.

B.C.- This disease was general on Vancouver island and in the lower Fraser valley. The damage was slight.

STEM ROT - Corticium Solani (Prill. & Del.) Bourd. & Galz.

B.C.- Stem rot was general, but caused slight damage on Vancouver island and in the lower Fraser valley.

RUST - Coleosporium Solidaginis (Schw.) Thüm.

N.B.- China aster was moderately infected in the plots at Fredericton. The damage was slight.

CHRYSANTHEMUM

BLOSSOM BLIGHT - Botrytis cinerea Pers.

B.C.- Blossom blight was rare on Vancouver island.

POWDERY MILDEW - Oidium Chrysanthemi Rabh.

B.C.- Powdery mildew was general on Vancouver island and in the lower Fraser valley. The damage was severe.

DAHLIA

MOZAIC - Virus

P.E.I.- Traces of mosaic occurred at the Experimental Station, Charlottetown. The diseased plants were badly dwarfed, and matured early or died. This disease is evidently carried over in the tuber as sets from infected plants have consistently yielded diseased plants in the last three years.

TUBER ROT - Bacterial

N.B.- A bacterial rot affected about 5 per cent of the tubers in the plots at Fredericton.

ENGLISH IVY

LEAF SPOT - Colletotrichum trichellum (Fr.) Duke
(Vernicularia trichella Fr.)

B.C.- This leaf spot is general on Vancouver island. The damage is slight (W. Newton).

An examination of the specimens sent by Dr. Newton showed that the fruit body is a typical acervulus on which are borne the spores and the stout setae. In the absence of a pycnidium we have followed Miss Duke in placing the fungus in the genus Colletotrichum. (I.L. Connors & A.S. Hill)

FLOWERING CURRANT (Ribes aureum)

WHITE PINE BLISTER RUST - Cronartium ribicola Fischer

Que.- A trace of rust was found at L'Assomption.

GERANIUM (Pelargonium)

LEAF SPOT - Cercospora Brunkii Ell. & Ev.

Ont.- This leaf spot was destructive to two kinds of geraniums in a greenhouse at Belleville. The identification of the fungus was confirmed by Dr. C. Chupp. This report is apparently the first Canadian record.

ROOT ROT - Pythium de Baryanum Hesse var. Pelargonii H. Braun

Man.- This disease appeared in a greenhouse at Winnipeg. A

culture of the pathogen made by Dr. Bisby was compared with an authentic culture of the above named species and no difference could be found between them. This probably is the first report for Canada (T.C. Vanterpool).

GLADIOLUS

SCAB - Bacterium marginatum McCull.

B.C.- Scab was general on Vancouver island and in the lower Fraser valley.

Alta.- Scab was found at Vermilion.

Que.- One hundred per cent of the crop was affected and severely damaged in a garden in Jacques Cartier county. The bulbs were planted on new land, but were not treated.

N.B.- Scab caused moderate damage to gladioli at the Experimental Station, Fredericton.

HARD ROT - Septoria Gladioli Pass.

B.C.- Hard rot was general on Vancouver island and in the lower Fraser valley. The damage was moderate.

N.B.- Hard rot caused moderate damage at Fredericton.

MOSAIC - Virus

B.C.- Mosaic was general, but did slight damage on Vancouver island and in the lower Fraser valley.

GOLDENGLOW (Rudbeckia)

POWDERY MILDEW - Erysiphe Cichoracearum DC.

Ont.- Powdery mildew is quite common on goldenglow at Ottawa.

HOLLYHOCK (Althaea)

RUST - Puccinia Malvacearum Bert.

B.C.- Rust was general on Vancouver island and in the lower Fraser valley. The damage was slight. The disease was also abundant at Summerland.

Ont.- Rust was severe in a garden at Rodney.

Que.- Rust was abundant about Montreal. The damage was probably slight. It was quite common on the lower leaves at Lennoxville, Abbotsford, and Ste. Anne de la Pocatière.

N.B.- Rust was general on hollyhocks throughout the province, causing serious damage to the plants.

P.E.I.- Rust infections varied from a trace to very heavy, causing slight to severe damage in Prince and Queens counties. Bordeaux liquid spray reduced the amount of infection. Lime sulphur spray and sulphur dust caused early defoliation.

ROOT ROT - Plenodomus Meliloti Dearn. & Sanford

Alta.- Two cases of root rot were reported at Edmonton.

Sask.- Specimens affected with Plenodomus were collected by A.R. Brown at Regina. The plants may have been winter killed, but Plenodomus was probably responsible in part for their death. (P.M. Simmonds)

LEAF SPOTS

Ascochyta parasitica Fautr. was found fruiting on small gray spots on the upper side of the leaves at Abbotsford and Lennoxville, Que. The infection was heavy in the latter collection. A few spots on a few leaves collected at Abbotsford were caused by Ascochyta althaeina Sacc. & Bizz.

WILT - Sclerotinia sp.

N.B.- Seventy-five per cent of plants were affected by wilt. The damage was slight.

HONEYSUCKLE (Lonicera)

LEAF BLIGHT - Glomerularia Corni Pk.

Ont.- Leaf blight caused a slight infection on escaped bushes of Lonicera tatarica at Ottawa. The identification of the fungus was confirmed by Dr. G.R. Bisby.

Que.- Leaf blight was found at Lennoxville and Ste. Anne de la Pocatière.

POWDERY MILDEW - Microsphaera alni (Wallr.) Salm. var.
Lonicerae (Schlecht.) Salm.

Alta.- Powdery mildew was reported from Kinuso.

Sask.- A fairly heavy infection was present on a few bushes near the Laboratory of Plant Pathology, at Saskatoon.

Que.- Powdery mildew affected all the honeysuckle shrubs at the Experimental Station, Ste. Anne de la Pocatière.

HYDRANGEA

POWDERY MILDEW - Oidium sp.

Sask.- One house plant brought to the Laboratory at Saskatoon on June 4, was being defoliated by powdery mildew. The conidial stage of one of the Erysiphaceae was present in abundance.

IRIS

LEAF SPOT - Didymellina macrospora Kleb.
(Heterosporium gracile Sacc.).

B.C.- Leaf spot was general and caused severe damage on Vancouver island.

Sask.- A light infection of leaf spot was present on Sept. 10, on some of the plants in the University garden, Saskatoon. By Sept. 30 infection varied from light to heavy on 25 per cent of the leaves. The mild weather in the interval favoured the spread of the disease.

Que.- Infections of leaf spot varying from a trace to slight were observed at L'Assomption, Lennoxville, Abbotsford, Beebe, and Ste. Anne de la Pocatière.

N.B.- Leaf spot was noted in garden plantings in York county, causing slight to severe damage.

N.S.- Leaf spot caused the death of 20 per cent of the leaves in a small garden in Annapolis county.

P.E.I.- Heavy infection of leaf spot caused severe damage to the leaves in many gardens in Queens county.

RHIZOME ROT - Bacillus carotovorus L.R. Jones

Sask.- A slight amount of rhizome rot was present in the University plots, Saskatoon.

N.B.- Rhizome rot is common and widespread in the province.

CROWN ROT - Sclerotium Delphinii Welch

N.B.- A severe infection of crown rot was found in a garden plot at Sackville.

BULB ROT - Bacillus carotovorus L.R. Jones

B.C.- A bulb rot attributed to Bacillus carotovorus was general on Vancouver island. The damage was considerable. A species of Penicillium was also found associated with bulb rot.

MOSAIC - Virus

Ont.- Mosaic affected quite a number of the plants of Iris tingitana in greenhouses at Toronto and Brampton. The bulbs, from which these plants were grown, were imported from France.

JAPANESE BARBERRY (Berberis Thunbergii)BACTERIAL LEAF SPOT - Phytophthora Berberidis Thornbery & Anderson

Ont.- This disease has been observed on the Japanese barberry in the Arboretum at Ottawa for the past ten years. (H.T. Gussow).

LARKSPUR (Delphinium)BACTERIAL BLIGHT - Pseudomonas Delphini (E.F.Sm.) Stapp

B.C.- Diseased leaves sent in for examination from Vancouver were found affected with bacterial blight (G.E. Woolliams).

N.B.- Bacterial blight is common throughout the province. The disease is severe in some gardens.

WILT - Fusarium sp.

B.C.- One per cent of the plants were affected with wilt in a garden at Kelowna.

STEM ROT - Ascochyta sp.

Alta.- Stem rot apparently due to an Ascochyta caused severe injury in a garden at Edmonton.

LILACPOWDERY MILDEW - Microsphaera Alni (Wallr.) Salm.

Powdery mildew was fairly abundant on lilac at Ottawa, Ont.; Beebe and Ste. Anne de la Pocatière, Que.; and Charlottetown, P.E.I.

LEAF SPOT - Phyllosticta Syringae West.

Que.- About 5 per cent of the leaves were affected with leaf spot at Beebe. On some leaves one or two small spots occurred, on others the spots were large.

LILYFLOWER BLIGHT - Botrytis sp.

B.C.- Flower blight was general on Vancouver island. The damage was severe.

LUPINE (Lupinus)RUST - Uromyces Lupini Berk. & Cke.

B.C.- Rust is common on both cultivated and wild species of lupine in the Victoria district, V.I.

POWDERY MILDEW - Erysiphe Polygoni DC.

B.C.- Powdery mildew is present on lupine on Vancouver island.

NARCISSUSSMOULDER - Botrytis narcissicola Kleb.

B.C.- Smoulder was general, but the damage was slight on Vancouver island.

MOSAIC - Virus

B.C.- Mosaic was general on Vancouver island, but the damage was slight.

GREY DISEASE - Virus

B.C.- Grey disease characterized by a light-green or grey mottling of the leaves, was general on Vancouver Island, causing slight damage.

EELWORM - Tylenchus dipsaci (Kühn) Bastian

B.C.- Eelworm was present on Vancouver island, but the damage was slight.

A number of diseased bulbs were received at the Saanichton Laboratory for examination. These bulbs had been graded out from a five acre field near Sidney. Besides bulb flies and bulb mites, two different eelworms were identified. One was Tylenchus dipsaci; the other belonged to the genus Diplogaster. Specimens of the latter were sent to Dr. Steiner, Senior Nematologist, U.S.D.A., Washington, D.C. He kindly identified it as Diplogaster longicaudatus Bütschli. He stated that it is not considered to be the primary agent, but as a secondary agent it plays an important role in the final breakdown of the infected plants. This appears to be the first time that this nematode has been reported in Canada (R.J. Hastings).

PANSY (Viola tricolor)

POWDERY MILDEW - Sphaerotheca Humuli (DC.) Burr. var. fuliginea (Schlecht.) Salm.

B.C.- Powdery mildew was quite severe in a garden near Summerland.

PEONY (PAEONIA)

BLIGHT - Botrytis Paeoniae Oud.

N.B.- Blight is widespread, but the damage is slight.

N.S.- Blight was reported from several parts of the province. One nurseryman reported control of early infections by watering with Semesan solution in the spring.

LEAF BLOTCH - Cladosporium Paeoniae Pass.

Que.- A trace of leaf blotch was collected at L'Assomption.

PETUNIAMOSAIC - Virus

Sask.- About 5 per cent of the plants were affected with mosaic in a bed, 10 x 50 feet. The affected plants were "bunchy", slightly dwarfed with pale yellow, ruffled leaves. The flowers were smaller than normal, mottled pink and white instead of being a deep solid pink.

WILT - Sclerotinia Sclerotiorum (Lib.) de Bary

Alta.- Wilt caused slight damage to petunias in an Edmonton garden.

PHLOXLEAF SPOT - Septoria divaricata Ell. & Ev.

Que.- About a dozen plants were found heavily infected in a garden at Beebe.

POWDERY MILDEW - Erysiphe Cichoracearum DC.

Ont.- Powdery mildew was found in a garden in Lincoln county.

ROSE (Rosa)RUST - Phragmidium spp.

B.C.- Rust was general on roses on Vancouver island; the damage was slight. Specimens collected at Saanichton were infected with Phr. disciflorum (Tode) J.F. James.

Que.- A fairly heavy infection of rust caused by Phr. americanum Diet. was present on 50 per cent of the leaves at Abbotsford. Rust due to Phr. disciflorum was quite common at Beebe and Ste. Anne de la Pocatière.

N.B.- Rust on rose is widespread in York county.

P.E.I.- Rust infection was noted on the varieties grown at the Experimental Station, Fredericton, as follows; heavy, Star of Waltham, Duke of Edinburgh, General Jacqueminot, A.E. Williams, Margaret Dickson, Frau Karl Druschki, Louise Cretté, Alfred Colomb, Baron de Rothschild, and Lady Astor; trace, Captain Hayward; none, Crimson Rambler and Edith Cavell. Where the rust was heavy, the older leaves were destroyed. (R.R. Hurst)

BLACK SPOT - Diplocarpon Rosae Wolf
(Actinonema Rosae (Lib.) Fr.)

Sask.- Black spot was present as follows in the University garden, Saskatoon: Persian Yellow, heavy, causing defoliation of the lower leaves; Austrian Yellow, heavy, causing some defoliation; Le Rêve, heavy; Conrad F. Meyers, heavy on lower leaves; Rubrifolia, moderate; Rubrosa, light; Harison's Yellow, growing close to Persian Yellow, no infection.

Ont.- Black spot was prevalent causing defoliation on several varieties in Lincoln county.

N.B.- Black spot was common and widespread in the province. The damage was slight.

P.E.I.- This disease was quite common this season; severe damage in many instances.

POWDERY MILDEW - Sphaerotheca pannosa (Wallr.) Lév.

B.C.- Powdery mildew was prevalent and caused severe damage on Vancouver island. Some mildew was present on practically all varieties and severe on a few at Penticton and Summerland. The disease was more prevalent than usual.

Ont.- Powdery mildew was prevalent and severe over much of the Niagara peninsula. It was rather severe on most varieties in many private gardens at St. Catharines. Control measures were ineffective due to the extremely humid weather.

P.E.I.- Edith Cavell and Margaret Dickson were slight to moderately infected. The disease is seldom serious.

CANE BLIGHT - Leptosphaera Coniothyrium (Fuck.) Sacc.
(Coniothyrium Fuckelii Sacc.)

Ont.- This disease was severe in 1930 on two climbing roses in Lincoln county, destroying more than two thirds of each bush. Other varieties in the immediate vicinity did not seem to be affected.

SALPIGLOSSIS

MOSAIC - Virus

B.C.- What appeared to be mosaic affected several plants in a plot at Summerland.

SNAPDRAGON (Antirrhinum)

RUST - Puccinia Antirrhini Diet. & Holw.

B.C.- Rust was general and severe on Vancouver island. It was also severe in some plots at Kelowna.

Ont.- Rust was very prevalent in all parts of Western Ontario. In many cases hundreds of plants were severely damaged.

YELLOWS - Virus

N.B.- What appears to be yellows is common at the Experimental Station, Fredericton.

WILT - Verticillium spp.

Ont.- Wilt was general and caused the death of many plants in Lincoln and York counties.

STEM ROT - Sclerotinia Sclerotiorum (Lib.) de Bary

Alta.- Stem rot was found in a garden at Edmonton. The damage was slight.

SWEET PEA (Lathyrus)

POWDERY MILDEW - Microsphaera diffusa Cke. & Pk.

Que.- Powdery mildew was quite prevalent at Cap Rouge. A small amount was also present at L'Assomption.

ROOT ROT

Sask.- Sweet peas were severely affected with a root rot as they were coming into flower in the City Gardens, Saskatoon. The peas were sown in a trench in well manured, limed soil and kept well watered. Isolations suggested that the disease was of bacterial nature.

P.E.I.- A root rot, the cause of which was undetermined, was reported several times from each county. Infection varied from 5 to 100 per cent; the damage was often severe.

WHITE MOULD - Erothrotheca multiformis Martin & Charles
(Cladosporium album Dows.)

B.C.- On July 5 at Duncan, in the Cowichan district, Vancouver island, a leaf mould was discovered on sweet pea. The

disease was general on plants being grown for exhibition purposes under the Cordon system. It was also severe among the unpruned plants growing in a hollow along a creek, a location, where the temperature and humidity were high. Although the losses were considerable among the exhibition plants and in the general crop in the hollow by the creek, they were insignificant in the rest of the ten-acre block. The general crop was grown staked on brush under ordinary field conditions.

From a study of the symptoms and the associated fungus, it was evident that the disease was identical to the white mould of sweet pea described in England in 1924 by Dowson (1). He named the pathogen, Cladosporium album Dows. In 1928 Martin & Charles (2) described the perfect stage as Erothrotheca multiflormis and reported the disease in Massachusetts, New York, and Pennsylvania. As far as it is known, this is the first record of this disease in Canada (R.J. Hastings).

TULIP

BLIGHT - Botrytis Tulipae (Lib.) Lind

P.E.I.- Blight varied from a trace to heavy on late flowering tulips in Queens county; the damage was slight to severe. This disease causes severe damage each year to tulips.

BLUE Vervain (Verbena hastata)

LEAF SPOT - Septoria Verbenae Rob. & Desm.

Que.- A dozen plants were severely affected with leaf spot at Beebe. The causal organism agreed with S. Verbenae as described by Saccardo (Syll. 3:537) on V. officinalis except that the spores measured 18-30 x 1.5u instead of 40-45 x 1-1.5u.

(1) Dowson, W.J. A new disease of sweet peas. Jour. Roy. Hort. Soc. 49:211-221. 1924.

(2) Martin, G.H. & Charles, Vera K. Preliminary studies of the life history of Erothrotheca multiflormis, the perfect stage of Cladosporium album Dowson. Phytopath. 18:839-846. 1928.

VIRGINIA CREEPER (Parthenocissus quinquefolia)

POWDERY MILDEW - Uncinula necator (Schw.) Burr.

Ont.- Powdery mildew was common at Ottawa.

WISTERIA

LEAF SPOT - Phyllosticta Wistariae Sacc.

Que.- About 10 per cent of the leaves were moderately infected at Beebe.

YUCCA

LEAF SPOT - Coniothyrium sp.

N.S. - About 20 per cent of the leaves were affected in a group of plants on the Experimental Station grounds, Kentville. The damage was slight.

ZINNIA

POWDERY MILDEW - Erysiphe Cichoracearum DC.

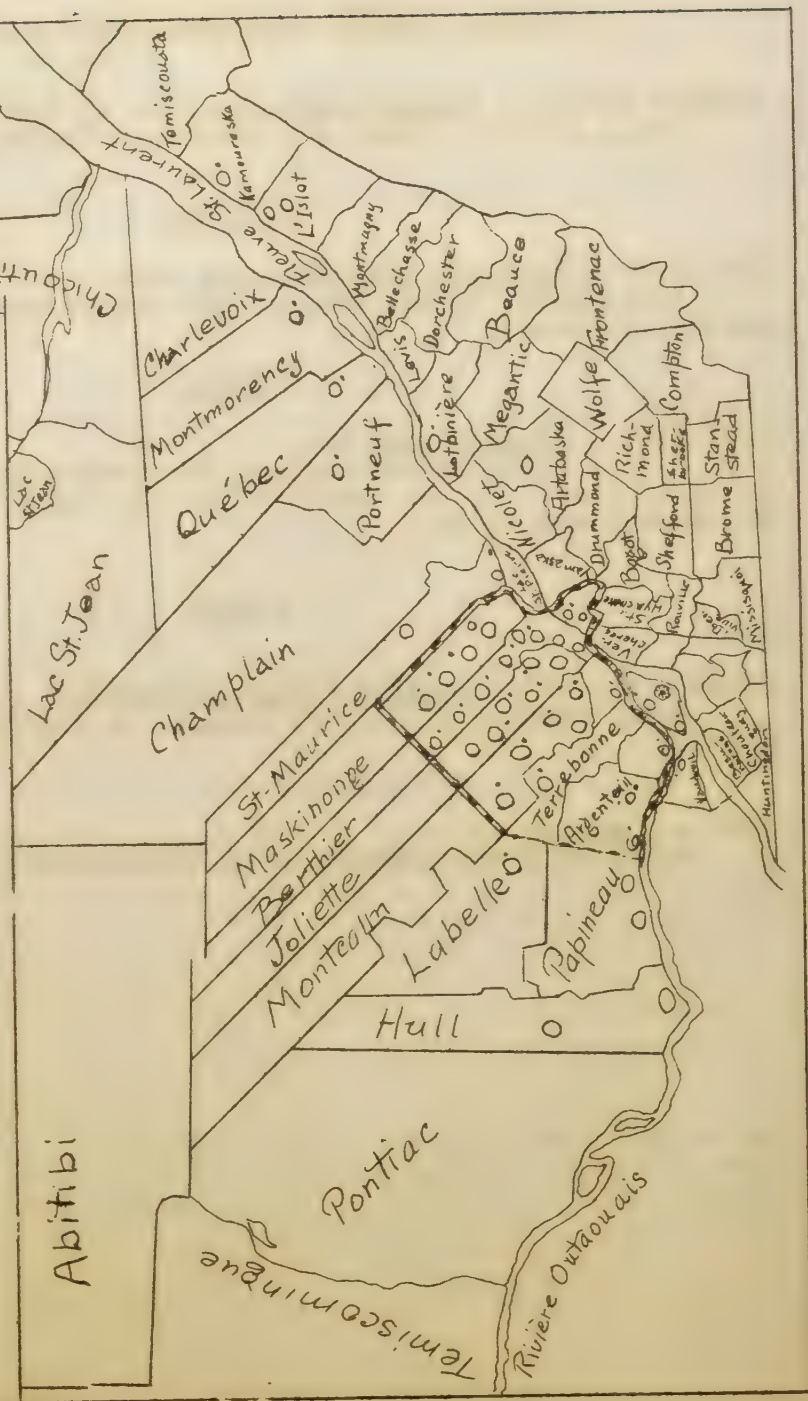
Ont.- Powdery mildew was general on Zinnia in Lincoln county.

WILT - Fusarium sp.

B.C.- Wilt was present in an experimental plot at Summerland.

Distribution de la Rouille vesiculeuse du Pin blanc dans la province de Québec

- Limite du territoire inspecté en 1931
- Place où la rouille a été trouvée sur les Kibes
- Place où la rouille a été trouvée sur les Pins blancs



Distribution de la Rouille vésiculeuse du
Pin blanc dans la province de Québec.

René Pomerleau.

Les premiers signalements de la présence de la Rouille vésiculeuse du Pin blanc causée par le Cronartium ribicola F. de Wald, dans la province de Québec, furent faits vers 1916; mais on n'avait constaté la rouille que sur les feuilles de Ribes. En 1918 elle était trouvée sur les pins dans le comté de Portneuf. Depuis on n'a pas cessé de la signaler un peu partout.

La carte adjointe indique les comtés et les localités où la rouille a été observée jusqu'à date. Il n'y a pas de doute qu'elle est beaucoup plus répandue qu'il est indiqué mais il n'y a pas à connaissance de l'auteur d'autres mentions officielles.

Au cours de cette année (1931), le Département des Terres et Forêts de cette province a organisé une patrouille pour déterminer l'étendue des dégâts causés par cette maladie et aussi pour localiser dans un certain rayon les peuplements de Pins blancs, afin de pouvoir organiser le travail d'éradication au cours des années à venir.

Nous avons parcouru pendant la belle saison toute l'étendue des comtés de Maskinongé, Berthier, Joliette, Montcalm, L'Assomption, Terrebonne, Deux-Montagnes, Argenteuil et Richelieu, mais en nous limitant aux propriétés privées sans toucher aux limites affermées de la couronne.

Il a été localisé, inspecté et situé sur des cartes 107,604 acres de forêt contenant de 25 à 100% de Pin blanc, ce qui donne 619,667,900. P.M.P. L'âge des pins varie de 35 à 100 ans avec une moyenne approximative de 40 ans.

Dans la presque totalité des peuplements la Rouille vésiculeuse a été trouvée et dans certains peuplements près de 20% des arbres portaient un ou plusieurs chancres, mais en moyenne nous trouvons de 1 à 7% d'infection.

L'âge des chancres varie de 3 à 7 ans, c'est-à-dire que les plus vieilles infections remontent à 1924-25, mais la plupart datent de 1926-27. Encore très peu de pins sont morts par la rouille vésiculeuse, mais beaucoup portent des attaques mortelles. Nous avons fréquemment trouvé des arbres qui portaient des chancres suffisamment développés pour entraîner la mort de la tête et quelquefois même des têtes sont tombées parce que le tronc a cassé à l'endroit du chancre.

En général les infections ne sont pas très vieilles dans cette partie de la province, c'est pourquoi nous n'avons pas encore de dégâts très apparents dans les peuplements naturels de Pins blancs.

Les Ribes sont en assez grande abondance dans cette partie de la Province. Tous les terrains boisés contiennent un assez grand nombre de Ribes, nombres qui peut être évalué de 5 à 15 à l'acre.

L'espèce de Ribes la plus répandue est sans contredit le R. glandulosum, sur laquelle la rouille est presque toujours trouvée. Vient ensuite le R. Cynosbati qui est presque aussi généralement trouvé et sur lequel la rouille est aussi généralement présente. Le R. triste var. albinervum est aussi très fréquent et presque toujours infecté par la rouille. Le R. lacustre est un peu moins abondant mais semble aussi susceptible que les précédents à la rouille. Le R. americana, qui occupe une place prépondérante le long des rivières et les cours d'eau, surtout dans les localités qui sont situées le long du fleuve St-Laurent, porte, presque aussi fréquemment que les précédents, des taches de rouille. Cette dernière espèce est aussi cultivée quelquefois comme arbuste fruitier. Les autres Ribes comme R. hirtella et R. oxycnathoides sont très peu répandus dans ces régions.

Le Ribes nigrum, qui est presque généralement cultivé chez les cultivateurs et les petits propriétaires de cette province, est une cause importante de la distribution de la rouille; car il est toujours trouvé avec des feuilles couvertes de spores pendant le mois d'août. Les R. Grossularia et vulgare sont peut-être plus fréquemment cultivés que le précédent, mais ils semblent moins susceptibles à l'attaque de la rouille; surtout le dernier. C'est ainsi que l'on trouve des jardins où le R. nigrum est très fortement infecté tandis qu'il est difficile de trouver de petites infections sur le R. Grossularia et beaucoup moins sur le R. vulgare.

A part ces comtés d'autres parties ont été visitées comme les plantations, les pépinières et quelques forêts des limites affermées de la couronne.

Dans les plantations de pins les dégâts dus à cette maladie sont plus graves. Ainsi dans la plantation de la Canadian International Paper Co. située au Lac Caché dans le comté de Terrebonne, plus de 50% des pins plantés sont sévèrement attaqués et tous les autres sont voués à une mort prochaine à cause de l'abondance incroyable des Ribes dans cette plantation. Les Ribes ont pris ce développement extraordinaire sans doute après

le passage de l'incendie qui est une perturbation suffisante pour causer ce développement.

Nous avons commencé un travail d'éradication dans cette plantation mais nous nous sommes bientôt aperçus que ce n'était pas pratique car nous trouvions de 600 à 800 buissons de Ribes à l'acre. Le coût de l'extraction aurait été très élevé sur ce terrain à cause des difficultés topographiques et du nombre trop élevé des Ribes.

Pour compléter nos renseignements sur la distribution de la rouille, nous avons inspecté, sur une petite échelle cependant, les peuplements naturels de quelques limites. A la Montagne Tremblante, comté de Terrebonne, un peuplement de pins de 250 acres, contenant environ 20% de Pins blancs a été inspecté. Nous avons trouvé près de 45% des jeunes pins de moins de 10 ans qui portaient des infections et beaucoup d'adultes qui étaient atteints. Par contre dans les limites situées à quelque distance de la Gatineau (Rivière-à-l'Aigle) l'inspection ne nous a pas révélé la présence de la Rouille sur les Pins blancs ni sur les Ribes.

D'autres tentatives d'éradication ont aussi été faites cette année dans la Province. A St-Jovite, comté de Terrebonne, une plantation de la compagnie Canadienne Internationale a été protégée de la Rouille qui menaçait de la détruire. Mais le travail le plus important d'éradication des Ribes a été conduit à la pépinière de Berthierville où la Rouille vésiculeuse existait et était un danger grave pour la cause du reboisement.

La pépinière et les plantations de Berthierville occupent une superficie de 1,111.29 acres; pour protéger cet espace nous avons établi un rayon de 1500 pieds exempt de Ribes et formant un total de 3877.94 acres. La partie boisée de cette zone a été parcourue par une équipe de 20 hommes dispersés sur une distance de 180 pieds de telle sorte que chaque homme pouvait surveiller et arracher les Ribes sur une largeur de 10 pieds.

Un total de 8860 buissons de Ribes ont été ainsi enlevés; ce qui donne une moyenne de 2.28 buissons à l'acre. Le coût de l'éradication, en tenant compte que ce travail a été fait d'une façon systématique et que des plans, où tous les buissons de Ribes sont situés, ont été faits pour faciliter la rééradication, ne fut que de \$0.462 de l'acre.

En résumé, la Rouille vésiculeuse du Pin blanc existe dans presque toutes les régions habitées le long du St-Laurent et de la rivière Outaouais à un pourcentage de 1 à 3% et la plupart des vieux chancres remontent à 1926-27.

Additions to
the Fungous Flora of Manitoba

G. R. Bisby, A. H. R. Buller, and John Dearnness

The following fungi have been recorded in Manitoba since the publication of "The Fungi of Manitoba" in 1929. They are arranged in the order used in the book and the page, on which the new record may be added, is indicated at the left. (Ingolf records are from the Ontario boundary.) Names marked "(n)" are near the species listed; these, and certain others, require further checking. Members of the Dominion Rust Research Laboratory have contributed some of the additions, and Dr. Jakob E. Lange of Denmark examined in the field, and supplied the names for, many of the Agaricaceae mentioned.

The 142 net additions listed here bring the known fungi of Manitoba (Nov. 1, 1931) to 2,109 species, plus about 20 on man and higher animals.

Note - Where a specimen has been deposited in the Division of Botany Herbarium the herbarium number is given in curves at the end of the record - I. L. Connors

Page Add

- | | |
|----|---|
| 51 | <u>Badhamia magna</u> Pk. On poplar, M.A.C. |
| 54 | <u>Bacillus lathyri</u> Manns & Taub. On sweet pea, Winnipeg. |
| 55 | <u>Saprolegnia Thuretii</u> de Bary. On flies in water, M.A.C. |
| 57 | <u>Zygorhynchus Vuilleminii</u> Namysl. From soil from Killarney. |
| 59 | <u>Ascobolus</u> (n) <u>glaber</u> Pers. On horse dung, M.A.C. |
| | <u>A. viridulans</u> Phill. & Plowr. On rabbit dung, M.A.C. |
| | <u>Ascophanus gallinaceus</u> (Pk.) Seaver. On partridge dung, M.A.C. |
| | <u>A. glaucellus</u> Rehm. On rabbit dung, M.A.C. |
| 61 | <u>Sepultaria</u> (n) <u>aurantia</u> Clem. In soil, Morris. (1180) |
| | <u>Arachnopeziza aurelia</u> (Pers.) Eckl. On birch, Victoria Beach. (1185) |
| 62 | <u>Ciboria luteovirescens</u> (Rob.) Sacc. On twigs, M.A.C. |

- Page Add
- 62 Dasyscypha (n) Willkomii (Hartig. On Pinus Banksiana,
Victoria Beach.
- 64 Schizoxylon decipiens Karst. var. Symphoricarpi Rehm,
M.A.C.
- 66 Eurotium pulcherrimum Wint. On dung of grouse and goose,
M.A.C.
- 67 Claviceps microcephala (Wallr.) Tul. On Polygonum pratense
and Panicularia grandis, Chater and Clandeboye.
Reported in the book as C. purpurea, of which C.
microcephala may be a form.
- 69 Stigmatospora Juniperi (Desm.) Wint. (MICROTHYRIALES),
Victoria Beach. (1181)
- 70 Pleurage (n) anomala D. Griff. On partridge dung, M.A.C.
- 71 Wallrothiella Arceuthobii (Pk.) Sacc. On Arceuthobium
americanum on Pinus Banksiana, Victoria Beach (S. Dow-
ding) (962). (cf. Dowding, E. Silver, Wallrothiella
Arceuthobii, a parasite of the Jack-pine mistletoe.
Can. Jour. Res. 5:219-230. pl. 1-2, text fig. 1-21
and map. 1931. - The author also reports the finding of
Wallrothiella Arceuthobii on jack-pine mistletoe north
of Edmonton, Alta. Between the N. Saskatchewan and the
Athabasca Rivers).
- Oothia Symphoricarpi Ell. & Ev. On Symphoricarpos, M.A.C.
- Amphisphaeria decolorans (Rehm) Br. On " " "
- A. incrustans E. & E. On Abies balsamea, Victoria Beach.
- 72 Lophidium compressum (Pers.) Sacc. On Populus, M.A.C.
- Lophiostoma (n) praemorsum (Lasch.) Fckl. On Symphoricarpos,
M.A.C.
- Didymella applanata (Niessl) Sacc. Substitute for
 Mycosphaerella rubina.
- 75 Ophiobolus (n) filisporus (C. & E.) Sacc. On Grindelia,
Ste. Agathe.
- O. trichisporus E. & E. (probably). On straw, M.A.C.

Page add

- 75 Pyrenophora Bromi (Died.) Drechsler. On Bromus inermis, I.A.C.
- 76 Anthostoma melanotes (B. & Br.) Sacc. var. Symphoricarpi Brenckle. M.A.C.
Diaporthe eres Wits. Also on Symphoricarpos, M.A.C.
- 78 Diatrype (n) bullata (Hoff.) Fr. On Populus, M.A.C.
- 80 Laboulbenia flagellata Peyr. On Elaphrus sp., Beulah.
- 81 Doassansia Martianoффiana (Thum.) Schroet. On Potamogeton, Norway House. (1177)
- 82 Chrysomyxa Arctostophyli Dietel on bear-berry, Victoria Beach. (1178)
Cronartium Quercus (Brondeau) Schroet. (C. Quercuum Miyabe). Recorded by Fraser and Connors (Trans. Roy. Soc. Canada., 19, p. 281) on Pinus sp., Morden.
- 83 Puccinia Anemones-virginianae Schw. On Anemone canadensis, M.A.C. (977)
- 84 P. Calthae (Grev.) Ik. On Caltha palustris, Victoria Beach. (923)
P. conglomerata Schm. & Kunze. On Petasites, Cowan.
P. Drabae Rud. On Draba ?daurica, Ft. Churchill (Fide I. Jorstad, Norway).
- 87 Rostrupia tomipara is a segregate of Puccinia Clematidis.
Uromyces Medicaginis Pass. Trace on alfalfa, M.A.C.
- 89 Corticium effuscatum Cke. & Ellis. Incorrectly spelled C. effusum.
Craterellus lutescens Pers. ex Fr. Among moss, Norway House.
Cyphella muscigena Pers. ex Fr. On moss, Vivian.
- 90 Peniophora affinis Burt on Poplar, M.A.C.

Page Add

- 91 Peniophora (n) laevis (Fr.) Burt. On Ulmus, M.A.C.
Thelephora laciniata (Pers.). Omit, as it is a synonym of
T. terrestris (Ehr.) Fr.
- 92 Pistillaria micans (Pers.) Fr. On old herbaceous stems,
M.A.C. (967)
- 97 Poria rhodella Fr. Swan River.
Boletus albellus Pk. Victoria Beach.
B. (n) castaneus Bull. Victoria Beach.
B. (n) chrysenteron (Bull.) Fr. Victoria Beach.
B. felleus Bull. Victoria Beach.
- 99 Clitocybe clavipes Fr. Ingolf.
C. Trogii Fr. Ingolf.
Collybia albiflavida (Pk.) Kauffman. Victoria Beach. /
- 101 Hygrophorus pustulatus (Pers.) Fr. Ingolf.
H. ?subrufescens Pk. Victoria Beach.
H. tephroleucus Pers. Ingolf.
- 102 Lactarius chrysorheus Fr. Victoria Beach.
Lactarius hyssinus Fr. Victoria Beach.
L. obnubilis Lasch. Ingolf.
L. thiogalus Fr. Ingolf.
- 103 Lentinus (n) badius Bres. Ingolf.
L. umbilicatus Pk. Kenora.
L. (n) Underwoodii Pk. Lac du Bonnet
Lepiota amianthina (Scop.) Fr. Ingolf.
L. (n) asperula Atk. Victoria Beach.

- 103 L. illinita Fr. Ingolf.
Marasmius scrocionius Fr. Ingolf.
M. semihirtipes Pk. M.A.C.
Mycena corticola Fr. M.A.C.
M. epipterygia Fr. Ingolf.
- 104 M. (n) lactea (Pers.) Fr. Ingolf.
Omphalia campanella Fr. var. badipus Fr. Ingolf.
O. fibuloides Pk. Vivian.
O. prxidata Bull. Vivian.
Pleurotus lignatilis Fr. Ingolf.
- 105 P. serotinus Fr. Ingolf.
Russula palustris Pk. Norway House.
- 106 T. spermaticum Fr., var. Substitute for T. (n) subacutum Pk.
Tricholoma vaccinum Fr. Ingolf.
- 107 Leptonia (n) lampropoda Fr. Victoria Beach.
- 108 Pluteus calocephus Atk. Victoria Beach.
P. roseocandidus Atk. Victoria Beach.
- 109 Cortinariu brunneus Fr. Ingolf.
C. cinnamomeus Fr. var. croceus (Schaeff.) Fr. Ingolf.
C. croceoconus Fr. Ingolf.
C. glandicolor Fr. Ingolf.
C. (n) multiformis Fr. Victoria Beach.
C. pluuius Fr. Ingolf.
C. purpurascens Fr. Ingolf.

- | <u>Page</u> | <u>Add</u> |
|-------------|--|
| 110 | <u>Flammula alnicola</u> Fr. Ingolf.
<u>F. penetrans</u> Fr. Ingolf.
<u>Galera hyonorum</u> Fr. var. <u>sphagnorum</u> (Pers.) Fr. Ingolf.
<u>G. raveda</u> Fr. M.A.C. |
| 111 | <u>Hebeloma gregarium</u> Pk. M.A.C.
<u>H. (n) hiemale</u> Bres. M.A.C.
<u>H. (n) pascuense</u> Pk. Victoria Beach.
<u>Inocybe (n) atripes</u> Atk. Victoria Beach.
<u>I. geophylla</u> Fr. var. <u>lateritia</u> (Weinm.) Stev. Ingolf. |
| 112 | <u>Nauccoria Myosotis</u> Fr. On sphagnum, Ingolf.
<u>N. vervacti</u> Fr. Victoria Beach.
<u>Paxillus (n) leptopus</u> Fr. Victoria Beach.
<u>Pholiota aurivella</u> (Batsch) Fr. Ingolf. |
| 113 | <u>Hypholoma Artemisiae</u> Pass. On sawdust, M.A.C.
<u>H. Polytrichi</u> Fr. In a muskeg, Ingolf.
<u>H. populinum</u> Britz., variety. Victoria Beach. |
| 115 | <u>Stropharia psathyroides</u> Lange. In moss, Ingolf. |
| 121 | <u>Lycoperdon echinatum</u> Pers. Ingolf. |
| 122 | <u>Acrostalagmus cinnabarinus</u> Cda. On potato tuber, M.A.C.
<u>Arthrobotrys superba</u> Cda. On dung and nemas, University and M.A.C.
<u>Aspergillus terreus</u> Thom. From butter, isol. at M.A.C. |
| 124 | <u>Cercospora (n) simulans</u> Ell. & Kell. On <u>Amphicarpa monoica</u> , M.A.C. |
| 126 | <u>Coremium cinereoalbum</u> (Bon.) Sacc. On rabbit dung from Menora. |

- 125 Cylindrium aeruginosum (Ik.) Lindau. On fallen oak leaves,
M.A.C. (1117)
- Fusarium (n) aquaeductum (Rad. & Rab.) Sacc. In slime
flux, Victoria Beach.
- 127 Gliocladium macropodium March. On goose dung from Rosser.
- Helminthosporium Bromi Tied. Stage of Pyrenophora Bromi,
M.A.C. (1175)
- H. Urticae Pk. On old stems of Urtica, M.A.C.
- 128 Hormioetis (n) alba Preuss. On poplar bark, M.A.C.
- Macrosporium Saccariae Pk. On Vaccaria Vaccaria, M.A.C.
(1176)
- Monilia (n) candida Bonord. On goose dung from Rosser.
- M. sitoshila (Mont.) Sacc. As a laboratory mould, M.A.C.
- Opsonia lactis (Fres.) Lindau. In milk etc., everywhere.
- 129 Polyscytalum sericeum Sacc. On old leaves, M.A.C.
- 130 Ramularia (n) variata Davis. On Mentha canadensis, M.A.C.
- Sclerotium bifrons Ell. & Ev. On leaves of Populus tremuloides, Victoria Beach and Bull Head, Lake Winnipeg,
(938).
- S. lichenicola Svend. On Cladonia, Victoria Beach.
- 131 Sepedonium niveum Masee & Salm. On rabbit dung, M.A.C.
- Sporotrichum parasiticum Pk. On black knot on Prunus,
Victoria Beach. (1174)
- Stachybotrys cylindrospora Jensen. In cultures, Rust Lab.
- S. lobulata Berk. On paper in a dung culture, M.A.C.
- Stysanus fimetarius (Karst.) Masee & Salm. On horse dung,
M.A.C.
- S. (n) microsporus Sacc. In cultures, Rust Lab.

Page Add

- 131 Trichoderma liceningi Oud. In cultures, Rust Lab.
- 135 Steganosporium Lautreyi Sacc. & Syd. On birch twigs,
Victoria Beach.
- Canarosporium Caraganae Karst. On old Caragana, M.A.C.
 (933)
- 136 C. (n) Negundinis Ell. & Ev. On Acer Negundo twigs,
 M.A.C.
- Coniothyrium (n) parasitans (Berk & Rav.) Tassi. On
 Hypoxylon, M.A.C. (1191)
- Cytospora leucostoma Sacc. On cult. plum, Morden.
- C. Symphoricarpi Ell. & Barth. Stage of Valsa, M.A.C.
- 137 Dothichiza Symphoricarpi Petrak. On S. occidentalis,
 M.A.C.
- Haplosporella Symphoricarpi Pk. (a variety) M.A.C.
- 138 Phyllosticta Bonanseana Sacc. On alfalfa, M.A.C.
- P. faticens Pk. On Nymphaea advena, Jack-fish Rapids
 near Norway House. Spores 7-10 x 2.5-3.8u. (1190)
- 139 P. hibiscina Ell. & Ev. On Hibiscus esculentus L., Morden.
 Spores 4-8 x 2u. (1186)
- 141 Septoria Caraganae (Jacz.) Died. On Caragana leaves,
 M.A.C. (1188)
- S. flagellaris Ell. & Ev. On Convolvulus sepium, M.A.C.
 Spores 50-86 x 2-3u. (1187)

Corrections to the Host Indices as Published

Host Index

- 156 Diatrype verrucaeformis on Corylus spp. C. Change to
 D. missouriensis E. & E. cf. p. 79
- 157 Lechnella sporotricha on Helianthus annuus equals
 Dasyscypha sporotricha (Oud.) Rehm cf. p. 62.
- Peniophora affinis on Populus spp. D cf. "p. 90"
 of Additions.

Host Index

Page

- 158 Arcyria nutans on Populus spp. E. Omit.
Physerum connatum " " " should be P. notabile
 Macbr. cf. p. 53
Hydnum populinum on Populus spp. E. Omit; too uncertain.
Poria vulgaris on Populus spp. E. should be P. selecta
 Karst. cf. p. 97.
- 159 Sphaeropsis Mali on Prunus (Padus) nana C. is probably the
 same as Sphaeropsis Malorum Pk. cf. p. 159. \
- Dasyscypha cerina on Quercus macrocarpa C. Omit; too
 uncertain.
- 160 Rhabdospora Symphoricarpi on Symphoricarpos occidentalis C.
 a nomen nudum.
- 164 Phyllosticta sp. on Hibiscus esculentus L. is P. hibiscina
 Ell. & Ev. cf. "p.139" of Additions.
- 165 Sclerotinia cinerea on Prunus nigra Ait. should be S.
americana (Worm.) Nort. & Ezekiel cf. p. 63.
Phyllosticta pirina on Pyrus baccata L. equals Coniothyrium
pirinum (Sacc.) Sheld cf. p. 136.
- 167 Uromyces flectens on Trifolium pratense L. should be on
T. repens L.
- 168 Cladochytrium Alismatis on Alisma subcordatum Raf. equals
C. maculare (Wallr.) Graff. cf. p. 55.
- 172 Septoria Heraclei on Heracleum lanatum Michx. equals
Cylindrosporium Heraclei E. & E. cf. p. 133.
- 173 Septoria ivaecola on Iva xanthifolia Nutt. Omit.
- 175 Cronartium Quercuum on Pinus spp. cf. C. Quercus (Brondeau)
 Schroet, "p.82" of Additions.

VII. DISEASES OF MISCELLANEOUS PLANTS

The parasitic fungi reported in this section are arranged under the scientific name of the host, on which they occur. The hosts are arranged alphabetically. All records, which were new or added to the information already published in the past two Surveys are reported here. In addition about one-tenth of the specimens added to the herbarium in the past year are reported. The number in curved brackets at the end of the item indicates the number under which the specimen is entered in the Division Herbarium. (The collections and exsiccatae in the Herbarium previous to 1929 are unnumbered). Some of these fungi and even some of the specimens have been reported in works readily available, but many of them have not been reported although specimens may be found in some herbaria. Time nor space did not permit of extending the list further. A very few saprophytic fungi are also added.

Acer saccharum Marsh.

Gloeosporium decolorans Ell. & Ev. July 28, Southwold Tp., Elgin Co., Ont. Coll. and Det. J. Dearness (1032)

Acer spicatum Lam.

Uncinula circinata Cke. & Pk. Sept. 18, Farmer's Rapids, Que. (1092)

Actaea rubra (Ait.) Willd.

Puccinia Clematidis (DC.) Lagerh. July 14, 1922, Treherne, Man.

Agropyron repens (L.) Beauv.

Phyllachora graminis (Pers.) Tuck. Sept. 16, Waterville, Que. Heavy.

Claviceps purpurea (Fr.) Tul. Sept., York county, N.B.

Agroseris sp.

Puccinia patuelis Arth. July 12, Elstow, Sask. (1039)

Agrostis tenuis

Tilletia decipiens (Pers.) Wint. Found Feb. 28 at Ottawa in a shipment of seed from the United States by Mr. Wright, Seed Branch. Det. H.L. Gussow and I.L. Connors. Source of seed unknown.

Alnus incana (L.) Moench.

Taphrina Alni-incanae (Kuhn) Magn. Sept. 12, Mer Bleu, Ont. (1097). Aug. 28, Ste. Famille, Que. (1095). Sept. 16, Lennoxville, Que.; Sept. 25, Farmer's Rapids, Que. (1094). Common in New Brunswick.

Alnus incana (cont'd)

Erysiphe aggregata (Pk.) Earle. Aug. 28, Ste. Famille, Que.
Microsphaera alni (Wallr.) Salm. Sept. 25, Farmer's
 Rapids, Que. (1005)
Phyllactinia cornulae (Pers.) Karst. Aug. 25, Deschambault,
 Que.; Sept. 25, Farmer's Rapids, Que. (1086)

Amaranthus retroflexus L.

Cystopus Bliti (Biv.-Bern.) Lévl. Aug. 19, Abbotsford and
 Aug. 25, Berthierville, Que. July 14, Vineland Station, Ont.
 July 16, Saskatoon, Sask. (1049)

Amelanchier sp.

Apiosporina Collinsii (Schw.) v. Höhn. Both conidial and
 perithecial stages in abundance. June 2, Kentville, N.S.

Apocynum scopulorum Greene

Cylindrosporium Apocyni Ell. & Ev. Aug. 6, Wroxtton, Sask.
 (914). Found also at Saskatoon. Abundant.

Arabis retrofracta Greene

Puccinia monspica Arth. May 1, Kelowna, B.C. Aeciospores
 from this collection germinated normally by a germ tube, May
 13 to 15 at Ottawa. (739)
Puccinia Holboellii (Hornem.) Rostr. May 1, Summerland,
 B.C. (740)

Aralia nudicaulis L.

Cercospora lentosperma (Pk.) Petrak, July 22, Jochin,
 Sask. Det. Dr. Dearness.

Arisaema triphyllum (L.) Schott.

Uromyces Galadii (Schw.) Earle. July 4, Vineland Station,
 Ont. Pycnia and aecia collected May 19, 1930 at Vineland
 Station.

Artemisia sp. (prob. camporum Rydb.)

Puccinia universalis Arth. July 21, North Battleford,
 Sask. (1051)

Asparagus officinalis L. (cult.)

Cladosporium fasciculare Fr. Present on a stem spot, Sept.
 29, Saskatoon, Sask. "May be this species" - Dr. Dearness.

Aster cordifolius L.

Puccinia asteris Duby, June 2, 1930, Lincoln county, Ont.
 Heavy. Also collected on A. acuminatus Michx. at the same place.

Aster novae-angliae L.

Colloesporium Solidaginis (Schw.) Thüm. Sept. 7, Billings Bridge, Ont.

Aster spp.

Colloesporium Solidaginis (Schw.) Thüm. Aug. 20, Abbotsford and Sept. 17, Sherbrooke, Que. Moderate to heavy infection.

Aster ?longulus Sheld.

Erysiphe Cichoracearum DC. Sept. 1, Saskatoon, Sask. Heavy (1054)

Avena fatua L.

Ustilago Avenae (Pers.) Jens. Experimental weed garden, University, Saskatoon, Sask; 0.5 per cent infection. Simmons (Sci. Agr. 11:73-79, 1930) reported that he had only found U. levis on wild oats in Canada (T.C. Vanterpool).

Betula sp.

Microsphaera Alni (Wallr.) Salm. Sept. 13, Elma Lake, Sask. (1061)

Bidens frondosa L.

Sphaerotheca Humuli (DC.) Burr. var. fuliginea (Schlecht.) Salm. Sept. 13, Farmer's Rapids, Que. (1091); Sept. 28, Hull, Que. (1038)

Bromus ciliatus L.

Urocystis Agropyri (Preuss.) Schroet. Aug. 1, Kepaswin, Alta. Marshy place.

Chamaenerion spicatum (Lam.) S.F. Gray

Puccinia ludibunda Ell. & Ev. Fairly abundant July 10, on one small bluff near Kelliher, Sask. (1037)

Chenopodium album L.

Peronospora effusa (Grev.) Rebh. July 16, Saskatoon, Sask. Heavy. (1050)

Chiogines hispidula (L.) T. & G.

Chrysomyxa Chioginis Diet, June 16, Clove, Que. (381)

Chrysanthemum Leucanthemum L.

Yellows (Virus). Found frequently on this weed in York county, N.B.

Circaea alpina L.

Puccinia Circaeae Pers. Sept. 1, 1927, Crooked River, Sask.
(1026)

Circaea pacifica Asch. & Magn.

Puccinia Circaeae Pers. Sept. 9, 1930. Langley Prairie,
B.C. (1053)

Cirsium arvense (L.) Scop.

Puccinia suaveolens Rostr. June 6, Abbotsford, Que. About
25 per cent of the plants affected.

Claytonia virginica L.

Puccinia Mariae-Wilsoni G.W. Clinton April 19, Lincoln
county, Ont. Aeciospores germinated by a germ tube. (R.Fitzpatrick)

Clematis ligusticifolia Nutt. (cult.)

Cercospora squalidula Pk. Aug. 13, 1928, Indian Head, Sask.
(1060)

Cogswellia macrocarpa (Nutt.) M.E. Jones

Puccinia Jonesii Pk. May 1, Summerland, B.C.

Corylus sp.

Gloeosporium Coryli (Desm.) Sacc. July 3, Lennoxville, Que.
Septoria corylina Pk. Aug. 27, Ste. Famille, Que.
Cryptosporella anomala (Pk.) Sacc. June 15, Port Burwell,
Ont. (861). (See U.S.F.D. Reporter Supp. 70. June 1, 1929, p. 257)

Crataegus sp.

Gymnosporangium clavipes Cke. & Pk. June 30, Bath, Ont.
(886) and July 6, Arboretum, Ottawa, Ont.

Ctenophyllum pectinatum (Hook.) Rydb.

Physalospora aurantia Ell. & Ev. Oct. 4, Saskatoon, Sask.
Septoria psammophila Sacc. Sept. 7, 1930, Sutherland, Sask.
On leaves and stems. Det. Dr. Dearness.

Eleagnus commutata Bernh.

Puccinia Caricis-Shepherdiae Davis, July 16, North Battle-
ford, Sask. (1036)

Elymus virginicus L.

Puccinia Clematidis (DC.) Lagerh. Sept. 7, Billings Bridge.
Ont.

Epilobium hirsutum L.

Pucciniastrum Epilobii Otth. Oct. 22, Kingston, Ont. (1069)

Equisetum affine Engelm.

Titeospora detospora (Sacc.) Bubak, June 12, Macdowall,
Sask. Det. Dr. Dearness.

Erigeron sp.

Yellows (Virus) Common on this weed at Fredericton, N.B.

Fraxinus americana L.

Piguetia Fraxini Berk. & Curt. Aug. 25, Berthierville, Que. (1099)

Fraxinus nigra Marsh

Phyllactinia corylea (Pers.) Karst. Sept. 18, Farmer's Rapids, Que. (1083)

Gaultheria procumbens L.

Schizothyrium Gaultheriae (Curt.) v. Höhn (Asterina Gaultheriae Curt.) Oct. 14, Cooksville, Ont. On plants for export. (1096)

Geranium Robertianum L.

Stigmatea Robertiani Fr. May 4, Vineland Station, Ont.

Glyceria grandis Wats.

Ustilago longissima (Sow.) Tul. Aug. 21, Colington, Alta.

Helianthus aridus Rydb.

Puccinia Helianthi Schw. II & III. Sept. 1, Saskatoon, Sask. Also collected at same time and place on H. petiolaris Nutt. and H. suberosus Bourgeau. (1055). On Helianthus annuus L. (cult.) Aug. 19, Broderick, Sask.

Hordeum sp. (cult.)

Helminthosporium teres Sacc. Aug. 14, Langham, Sask. (1045).

Hoseackia denticulata Drew

Erysiphe Polygoni DC. July 16, 1930, Saanichton, B.C. (1071)

Impatiens sp.

Plasmopora obducens Schroet. Sept. 18, Farmer's Rapids, Que. (1093)

Juncus tenuis Willd.

Uromyces Silphii (Syd.) Arth. Sept. Prince county, P.E.I.

Lactuca pulchella (Pursh) DC.

Puccinia petruelis Arth. July 12, Elfros, Sask. (1038)
Puccinia minusensis Thüm. O. Kelowna, B.C. (738)

Lapsana communis L.

Puccinia Lapsanae Fuck. Oct. 22, Kingston, Ont.

Leontodon autumnalis L.

Yellows (Virus). Widespread in York county, N.B., seriously injuring flower heads, which are often contorted and lacking in seed. (J.L. Howatt) Also observed at Kentville, N.S.

Lepargyrea canadensis (L.) Greene

Sphaerotheca humuli (DC.) Burr. Sept. 13, Emma Lake, Sask.

Lonicera tatarica L. (cult.)

Microsphaera Alni (Wallr.) Salm. var. Lonicerae (DC.) Salm. Sept. 3, Saskatoon, Sask. (1053)

Lycopus virginicus L.

Puccinia angustata Pk. Aug., Prince county, P.E.I. Common.

Matricaria inodora L.

Yellows (Virus) July 10, Sydney, N.S.

Mertensia paniculata (Ait.) G. Don.

Erysiphe Cichoracearum DC. Several plants were apparently killed in an experimental flower garden, Rosthern, Sask. on Aug. 1. (1040)

Osmorrhiza Claytoni (Michx.) Clarke

Puccinia Pimpinellae (Strauss) H. Mart. June 2, Lincoln county, Ont. Heavy.

Physalis heterophylla Ness

Puccinia Physalidis Pk. Aug. 18, Abbotsford, Que. About 50 per cent of the plants infected.

Pinus Banksiana Lamb.

Cronartium Comandrae Pk. June 12, Macdowall, Sask. (1035)

Plantago major L.

Erysiphe Cichoracearum DC. Aug. 26, Neuville, Que.
Yellows (Virus). Common at Fredericton, N.B.

Plantago Rugelii Doné.

Erysiphe Cichoracearum DC. Sept. 25, Farmer's Rapids, Que. (1089)

Podophyllum peltatum L.

Puccinia Podophylli Schw. Vineland Station, Ont. Telia on basal scales, May 8; aecia on leaves, May 20; telia on leaves, June 19. (R. Fitzpatrick). May 18, 1930, Georgetown, Ont.

Polygonum pennsylvanicum L.

Ustilago utriculosa (Nees) Tul. Aug., Fredericton, N.B.
Severe.

Polygonum Persicaria L.

Septoria Polygonorum Desm. Aug. 25, Berthierville, Que.

Ustilago utriculosa (Nees) Tul. Sept., Queens county,
P.E.I.

Potentilla canadensis L.

Paragmidium Potentillae-canadensis Diet. May 8, Annapolis
county, N.S.

Potentilla sp.

Pernospora Potentillae de Bary, Sept., Cavendish, P.E.I.
Heavy.

Phragmidium Potentillae (Pers.) Karst. July 23, Saskatoon,
Sask. Common (1042)

Prenanthes alba L.

Puccinia Orbicula Pk. & Clinton, July 8, Vineland Station,
Ont.

Prunus virginiana L.

Nectria cinnabarina (Tode) Fr. Oct. 7, Magog, Que., on dead
branches.

Pulsatilla ludoviciana (Mutt.) Heller

Puccinia Pulsatillae Kalchbr. Saskatoon, Sask. Heavy on
a few plants.

Ranunculus acris L.

Erysiphe Polygoni DC. Sept. 25, Farmer's Rapids (1090) and
Aug. 25, Berthierville, Que.

Ribes lacustre (Pers.) Poir.

Cronartium ribicola Fischer, Sept. 7, Billing's Bridge, Ont.

Ribes oxycanthoides L.

Puccinia Pringsheimiana Kleb. July 10, Kelliher, Sask.

Rosa ?pisocarpa Gray

Phragmidium Rosae-Californicae Diet. Oct. 12, Salmon Arm,
B.C. Coll. H.T. Gussow. (1100)

Rosa sp.

Phragmidium disciflorum (Tode) J.F. James, Oct. 22, Ottawa.
Ont. (1064)

Rubus ?allegheniensis Porter

Gymnoconia Peckiana (Howe) Trotter, Aug. 25, Berthierville,
Que.

Kuehneola albidula (Kühn) Magn. also at Berthierville.

Rubus ?canadensis L.

Gymnoconia Peckiana (Howe) Trotter, Aug. 25, Berthierville,
Que.

Kuehneola albidula (Kühn) Magn. Also at Berthierville.

Rubus Idaeus L. (cult.) var. Herbert.

Septoria Rubi West. Oct. 6, Sutton West, Ont. (1034)

Rubus sp.

Phragmidium imitans Arth. III. Light infection on native
red raspberry. Sept. 14, Emma Lake, Sask.

Gymnoconia Peckiana (Howe) Trotter. Very general and
severe in Kings county and the eastern part of Annapolis, N.S.

Sabina horizontalis (Moench) Rydb.

Karschia deformata Pk. June 13, Beaver Creek, Sask. Det.
Dr. Dearness.

Salix sp.

Rhytisma salicinum (Pers.) Fr. Aug. 13, Biggar, Sask.

Sambucus canadensis L.

Microsphaera Grossulariae (Wallr.) Lév. Sept. 25, Farmer's
Rapids, Que. Some of the perithecia were parasitized by Cicinn-
obolus Cesatii de Bary. (1088)

Sambucus canadensis L. var. laciniata.

Cytospora sp. (near C. Sambuci Died.) Saskatoon, Sask. 1931.
Det. Dr. Dearness.

Scirpus sp.

Hypoderma scirpinum DC. Sept. 13, Emma Lake, Sask. Det.
Dr. Dearness.

Scutellaria laterifolia L.

Erysione Cichoracearum DC. Sept. 18, Farmer's Rapids,
Que. (1084)

Setaria viridis (L.) Beauv.

Sclerospora graminicola (Sacc.) Schroet. July, Man., two
fields, Common.

Solidago rugosa Mill.

Coleosporium Solidaginis (Schw.) Thüm, Aug. 25, Berthierville,
Que.

Solidago rugosa (cont'd)

The rust was parasitized by Darlucia filum (Biv.-Bern.) Cast. The rust was also collected on Solidago sp. at Emma Lake, Sask.; Abbotsford and Beebe, Que.; throughout New Brunswick, and on S. canadensis in Queens county, P.E.I.

Solidago spp.

Puccinia extensicola Plowr. June 9, Ottawa, Ont.

Erysiphe Cichoracearum DC. Sept. 7, Billings Bridge, Ont.

Spergula arvensis L.

Yellows (Virus). Common in York county, N.B.

Stipa viridula Trin.

Ustilago hypodytes (Schl.) Fr. July 28, 1927, Oak Lake, Man.
(1081)

Claviceps purpurea (Fr.) Tul. July 31, 1928, Brandon, Man.
(1082)

Symphoricarpos sp.

Puccinia Crandallii Pamm. & Hume, July 17, North Battleford, Sask. (1041) Common in Saskatchewan.

Taraxacum officinale Weber.

Puccinia Hieracii (Schum) Mart. July 31, Saskatoon, Sask.
Common.

Ramularia taraxaci Karst. July, Kentville, N.S. Not as common as usual.

Sphaerotheca Humuli (DC.) Burr. var. fuliginea (Schlecht.)
Salm. Sept. 29, Saskatoon, Sask. Heavy.

Thermopsis rhombifolia (Wutt.) Richards.

Phoma thermopsidicola Henn. May 31, Saskatoon, Sask.
Abundant on the dead stems of last year's growth. Det. Dr. Dearness.

Thuja occidentalis L.

Keithia thuiina Durand, July 31, Biscotasing, Ont. Det. Irene Mounce. (1031)

Tilia americana L.

Uncinula Clintonii Pk. Sept. 25, Farmer's Rapids, Que. (1087)

Torresia odorata (L.) Hitchc.

Puccinia graminis Pers. Sept. 1, Saskatoon, Sask. Green vigorous plants, growing in a field of summer fallow among volunteer cereals, were heavily infected.

Trifolium hybridum L.

Uromyces Trifolii (Hedw.f.) Lévl. July 31, Melfort, Sask.
(1043) Polythrincium Trifolii Kunze also present.

Triticum aestivum L. (cult.)

Pileospora laevis Kuhn Aug. 13, Lett, Sask. (1062)
P. Tritici (Berk.) Wint. Aug. 13, Lett, Sask. (1058)

Ulmus glabra Huds. var. Camperdownii Redh.

Pileospora ulmicola (Biv.-Bern.) Allesch. Sept. 28,
Strathroy, Ont. Det. Irene Mounce. (1029)

Verbascum Blatteria L.

Sestonia verbascicola Berk. & Curt. July 9, Vineland Station,
Ont.

Vicia ?americana Muhl.

Uromyces coloradensis Ell. & Ev.C.I, old. Aug. 14, 1929,
St. Gregor, Sask. (1024)

Vicia Gracca L.

Microsphaera Alvi (Wallr.) Salm. Sept. 30, Abbotsford, Que.
Moderate infection, but common.

Uromyces Fabae (Pers.) de Bary, Sept. 18, Abbotsford, Que.
Heavy.

Viola pubescens Ait.

Puccinia Violae (Schum.) DC. Sept. 7, Billings Bridge, Ont.
Also collected on Viola sp. Sept. 18, Abbotsford, Que.

Les Nays L. (cult.)

Puccinia Sorghi Schw. Aug. 28, Ste. Anne de la Pocatière,
Que. (1045)

Zizania palustris L.

Claviceps purpurea (Fr.) Tul. Common along St. John river
about Fredericton, N.B. (J.L. Howatt)

Saprophytic Fungi

Ascothrella turbinata Seaver on dead wood, La Salle Woods,
Montreal, Que. Sept. 23, Coll. H.A.C. Jackson, Det. Irene
Mounce, confirmed, E.J. Seaver (1027); on decorticated
beech, Farmer's Rapids, Que., Sept. 25. Det. Irene Mounce.
(1028)

Mitrula irregularis (Pk.) Durand. Sept. 30, Branchley Beach.
 Coll. E. Hurst, Det. Irene Mounce (1030). Oct. 15, 1928,
 Childs Bush, near Hawthorne, Ont. (1077)

Patella scutellata (L.) Morgan, Between Swastika and Dane,
 Ont. Coll. L.O. Overholts, 13295; Det. Lillian Cash as
Lachnea scutellata (L.) Gill. (1075)

Patella theleboloides (Alb. & Schw.) Seaver, Ont. 20, Merr-
 ifield's Corners, Que. On old cow dung in pastures (1065)

Peziza clypeata Schw. On rotten wood, Sept. 12, La Salle woods,
 Montreal, Que. Coll. H.A.C. Jackson, Det. Irene Mounce.
 (1033)

Spathularia clavata (Schaeff.) Sacc. In coniferous woods,
 Oct. 20, Merrifield's Corners, Que. (1067)

Tylostoma campestre Morgan. May 10, Sutherland, Sask. Sandy
 location. Det. Dr. Dearness.

Underwoodia columnaris Pk. Aug. 1, Agricultural College, Man.
 1928. Coll. G.R. Bisby, (1080)

Urnula Craterium (Schw.) Fr. May 31, 1929, Agricultural College,
 Man. (1079)

INDEX OF HOSTS

Only the names of the cultivated plants have been included in this index. For diseases on plants not under cultivation the section on "Diseases of Miscellaneous Plants" should be consulted.

Alfalfa	23	Elm	82
Apple	59	English Ivy	92
Apricot	66	Firethorn	83
Arbutus	89	Flax	28
Ash	81	Flowering Currant	92
Asparagus	32	Geranium	92
Barley	17	Ginseng	40
Balsam Fir	82	Gladiolus	93
Basswood	81	Goldenglow	93
Bean	32	Gooseberry	70
Bean, Broad	34	Grape	70
Beech	81	Grasses, Cultivated	30
Beet	34	Hawthorn	83
Blackberry	66	Hollyhock	93
Blueberry	67	Honeysuckle	94
Blue Vervain	102	Hop	40
Butternut	81	Horsechestnut	83
Cabbage	35	Hydrangea	95
Cantaloupe	36	Iris	95
Caragana	89	Japanese Barberry	96
Carnation	89	Jerusalem Artichoke	40
Carrot	37	Larkspur	96
Cauliflower	37	Lettuce	40
Cedar	81	Lilac	97
Celery	37	Lily	97
Cherry	67	Loganberry	71
Chestnut	82	Lupine	97
China Aster	89	Mangel	29
Chrysanthemum	91	Maple	82
Clover, Common	25	Mountain Ash	84
Clover, Sweet	27	Mushroom	41
Corn	27	Narcissus	97
Cucumber	39		
Currant	68		
Dahlia	92		
Egg Plant	39		
Elder	82		

Oak	84
Oats	12
Onion	41
Orange	71
Parsley	93
Parsley	42
Pea	42
Peach	71
Pear	72
Peony	98
Pepper	43
Petunia	99
Phlox	99
Pine	84
Pine, White	84, 105
Plum	73
Poplar	86
Potato	43
Quince	75
Raspberry	76
Rhubarb	51
Rose	99
Rutabaga	51
Rye	21

Salpiglossis	100
Sandcherry	79
Snapdragon	101
Spinach	52
Spruce	86
Squash	52
Strawberry	79
Sunflower	29
Sweet Pea	101
Swiss Chard	52
Tobacco	52
Tomato	54
Tulip	102
Turnip	57
Virginia Creeper	103
Wheat	1
Willow	87
Wisteria	103
Yucca	103
Zinnia	103

DOMINION OF CANADA
DEPARTMENT OF AGRICULTURE
EXPERIMENTAL FARMS BRANCH

H. T. GUS^WSOW
Dominion Botanist

E. S. ARCHIBALD
Director

T W E L F T H A N N U A L

R E P O R T

O F T H E

C A N A D I A N

P L A N T D I S E A S E S U R V E Y

1932

Compiled by

I. L. Conners
Plant Pathologist

FOREWORD

The twelfth annual report of the Canadian Plant Disease Survey differs little in form or content from the last two reports. No special sections were contributed this year and in consequence the report is somewhat smaller than last year's. The number of individual reports was, however, equal to last year and many specimens and special notes were contributed.

There have been several new diseases, especially of bulbs and ornamentals reported for the first time in Canada. The most important was the epidemic of bacterial blight or Stewart's disease of sweet corn, which occurred in western Ontario.

I have not made a list of collaborators, but I wish to thank most cordially everyone who has contributed to the Survey. Mr. René Pomerleau, Berthier, Que., and Mr. R. C. Russell, Saskatoon, Sask., contributed a substantial list of parasitic fungi found chiefly on non-economic hosts in their respective province. Professor T. C. Vanterpool, Saskatoon, Sask., prepared a memorandum on certain mechanical diseases of wheat which should be helpful in diagnosing diseases of this type.

April 15, 1933
Division of Botany,
Ottawa, Ontario.

I. L. Connors
Plant Pathologist.

I. DISEASES OF CEREAL CROPS

WHEAT

STEM RUST - Puccinia graminis Pers.

Alta.- Stem rust was first observed on wheat on Aug. 7. It was found in zones 8 to 11 in 12 fields out of 488 examined. Infection was never more than a trace. (See 1930 Report for explanation of zones).

Sask.- Stem rust was found at Broadview on July 17 and on the experimental plots at Saskatoon on July 18. Rust infection was heaviest in eastern and south-eastern Saskatchewan. Due to hot weather in late July and to the lack of reserve soil moisture much of the crop ripened rapidly, if not prematurely, and in consequence no damage was caused by rust except to late crops.

Man.- The first infection of stem rust was observed at Morden on June 20. By the end of June, traces of rust could be found in The Red River valley as far north as Winnipeg. On a rust survey trip made July 12 to 14, a trace or a low percentage of rust was observed on most plants at Jordan and on about 10 per cent of the plants at Morden. Traces of rust were present on common wheat throughout southern Manitoba as far west as Virden, but stem rust was difficult to find in areas, where durum wheat chiefly replaced common. On a similar trip on July 25 to 28 all plants of common wheat were affected in the Red River valley, infection reaching a maximum of 2 to 5 per cent between Portage la Prairie and Winnipeg. In the southwestern part about Deloraine the crops were light and rust was correspondingly light. Traces of rust were found there and at Brandon, Birtle and Dauphin, while in the Swan River valley traces of rust were present on 5 per cent of the plants.

At harvest time rust infection ranged from a trace to 5 per cent in the south-western and northern areas of the province, the damage being very slight. In the Red River valley the range of infection was from 5 to 15 per cent; damage was less than 2 per cent.

Durum wheats were in general only lightly infected.

Ont.- In a survey trip from Ottawa to Brockville in late July, only traces of stem rust were found on wheat.

On May 18 pycnia of Puccinia graminis were just appearing on the purple-leaved barberry in Lincoln county. Infection was

moderately heavy. Mature aecia were found on June 9 in the Arboretum, Ottawa, on Berberis vulgaris, B. vulgaris var. purpurea and B. sinensis.

The following barberry plantings were located by personal observation or from information supplied by others and have been examined:-

(1) North Gore, Carleton Co.: 12 small bushes on a church property.

(2) Central Experimental Farm, Ottawa: Escaped bushes were observed by Mr. Anderson on the Experimental Farm. A single purple-leaved bush was found on the Merivale road, near Carling Ave., Ottawa. It seems probable that this bush is an escape from the Experimental Farm.

(3) Ramsay Tp., Lanark Co.: The original hedge on an estate at Appleton was not seen, but this property is the centre, from which barberries have escaped and spread out over an area apparently of considerable extent. In 1930 eradication was attempted under The Barberry Shrub Act 1929 of Ontario, but from observations made this past fall it is evident that chemical methods must be used on the more difficult terrain and a more careful survey of the whole area must be made to determine how far the barberry has spread.

(4) Lanark village, Lanark Co.: Two barberries were found on an estate, but no escaped bushes were noticed.

(5) Town of Perth, Lanark Co.: The oldest hedge is probably that on a property at the north side of the town. Subsequently other hedges have been planted in the town. The barberry has escaped into three of the neighbouring municipalities.

(6) Andrewsville, Lanark Co.: A cultivated hedge was found on a farm on Lot 4, Con.A, Montague Tp. The barberry has spread up and down the river for at least 6 miles. The crops were examined in this area for stem rust. In none of the fields were more than traces of rust to be found and the barberry did not appear to play an important role this year in initiating what rust there was. However, the barberries evidently had been heavily rusted in the spring. (I.L. Connors)

Que.- Stem rust slightly infected 5 to 50 per cent of the stems in eastern Quebec. It caused no apparent damage as infection was late.

Cultivated barberries were noted at Chelsea station, Chelsea and at the monument "Aux Braves", Chemin de St. Foy, Quebec city. Mature aecia were found on common and purple barberry at Macdonald College on June 16. First infections were observed on June 2, the last on July 28.

N.B.- Garnet was slightly infected at the Experimental Station, Fredericton. Practically no rust was to be found throughout the province.

P.E.I.- Wheat was heavily infected by stem rust late in the season in all parts of the province, and was seriously damaged. Stem rust appears to be on the increase in recent years, possibly due to favourable weather conditions late in the season.

LEAF RUST - Puccinia triticina Erikss.

Alta.- Leaf rust was found in zones 8 to 11 in 20 fields out of 488 examined. The infections varied as follows: in 11 fields, trace; in 3, light; in 4, medium; and in 2, heavy.

Sask.- Leaf rust was found in 98 out of 298 fields examined. It was first reported at Saskatoon on July 6, and was common in most fields in Saskatchewan by July 28. Infections were light in southern Saskatchewan, while they were very heavy and severe at Kinistino and Beatty in zone 10.

Man.- Leaf rust appeared early this year. Primary infections were found at Morden on June 12 and at Winnipeg on June 16. It was quite severe in southern Manitoba, infections ranging from 25 to 80 per cent. In northern Manitoba range of infection was from 5 to 25 per cent.

Ont.- In six fields of wheat between North Augusta and Ottawa in late July, infection ranged from 20 to 70 per cent.

Que.- Leaf rust was first observed at Macdonald College on June 30. Late infections ranged from 10 to 95 per cent on individual leaves. In eastern Quebec 75 per cent of the leaves were heavily infected with rust, which caused them to dry up prematurely.

N.B.- Red Fife and Huron wheat were moderately infected in Carleton and York counties.

P.E.I.- Leaf rust varied from a trace to very heavy on Aug. 1. During the next month it became very heavy in all parts of the province.

STRIPE RUST - Puccinia glumarum (Schmidt) Erikss. & Henn.

B.C.- Stripe rust was reported once from Vancouver island.

Alta.- Stripe rust was first observed in southern Alberta on July 8 on Hordeum jubatum. In central Alberta it was not seen until Aug. 10, when it was collected on the same grass. During

late August and September it became general in this region.

Stripe rust failed to overwinter in the tests and observations made on plants, which were heavily rusted late in October, 1931. The rust did not develop on the new foliage in April and May, when moisture conditions were apparently very favourable.

Bask.- Stripe rust was collected on Agropyron at Whitewood, Tp. 16, R.2, W. 2nd Meridian on Sept. 15. This collection is the most easterly made in Canada, being only some 35 miles from the Manitoba boundary. The rust was collected the previous day on Hordeum jubatum, at Regina and McLean, Tp. 18, R.16, W. 2nd M.

BUNT - Tilletia Caries (DC.) Tul. & T. foetens (Berk.) Tul.

Besides the field surveys in the separate provinces, Table 1 summarizes the data collected from the records of the Western Grain Inspection Division from Aug. 1, 1931 to October 31, 1932 on the amount and percentages of "smutty" wheat inspected. These data were kindly supplied by Dr. W.F. Hanna.

It will be seen from Table 1 that there has been a considerable reduction in the amount and percentage of "smutty" wheat inspected in the three months ending Oct. 31, 1932 in comparison with the corresponding period in 1931. The chief factor has been the marked decrease in the number of cars of durum wheat graded "smutty" in the latter period, the percentage falling from 5.7 per cent (6.5 per cent for the year 1931-32) to 1.2 per cent. The downward trend begun in 1931 has been definitely continued in 1932 in all kinds of wheat. The results of field inspections to be reported below confirm the inspection data.

Alta.- Bunt was found in 6 fields out of 488 inspected in widely scattered zones. The highest infection observed was one per cent.

Two cars of Garnet wheat grown at Chapman in 1932 graded "smutty" when inspected at Edmonton (1). This grain contained no bunt balls and lacked the characteristic odour of wheat infected with bunt. On examination the spores were found to be reticulated, but much smaller than those of Tilletia Caries. Examination of a sheaf of grain from the field, where the wheat was grown, disclosed the presence of a large percentage of weeds especially dock-leaved persicary, Polygonum lapathifolium L. Approximately

(1) Aamodt, D.S. & Malloch, J.G. "Smutty" wheat caused by Ustilago utriculosa on dock-leaved persicary. Can. Journ. Research 7:578-582, pl.1. 1932.

Table 1. Wheat Bunt in Western Canada

Period of Inspection	Cars Inspected	Cars "Smutty"	Percentage "Smutty"
3 months: Aug. 1, 1931 - Oct. 31, 1931			
Hard Red Spring	53,794	607	1.1
Alberta Red	57	8	14.0
Durum	3,509	200	5.7
All wheat	57,456	816	1.4
1 year: Aug. 1, 1931 - July 31, 1932			
Hard Red Spring	174,182	1,350	0.8
Alberta Red Winter	102	8	7.8
White Spring	262	0	0.0
Amber Durum	5,135	333	6.5
All wheat	179,768	1,695	0.9
3 months: Aug. 1, 1932 - Oct. 31, 1932			
Hard Red Spring	92,398	538	0.6
Alberta Red Winter	88	11	12.5
White Spring	85	1	1.2
Amber Durum	4,372	46	1.2
All wheat	97,001	599	0.6

one half of the persicary was heavily infected with a smut, *Ustilago utriculosa* (Nees) Tul. Aamodt and Malloch demonstrated conclusively that no bunt spores were present on the seed, but that the persicary smut had much the same effect on the flour and bread made from this "smutty" wheat as wheat contaminated with bunt spores. Thus, occasionally weeds may have a direct effect on the quality of crop from fields, in which they are growing.

Sask.- Bunt was observed in 6 fields out of 298 inspected, the highest infection being 4 per cent. *Tilletia caries* was found in 3 and *T. foetens* in one out of 4 samples examined,

Man.- Ten per cent of bunt was observed in one field at Neepawa.

Que.- Two fields showing 5 per cent of bunt were seen in Kamouraska county.

LOOSE SMUT - Ustilago Triticci (Pers.) Jens.

Alta.- Loose smut was found in 14 fields out of 488 examined, the average damage in infected fields being 0.6 per cent.

Sask.- A trace of loose smut was observed in 7 fields out of 298 examined.

Man.- Loose smut was found in 45 fields, causing an average damage of 1.6 per cent. Of these, 23 fields were sown with Reward wheat, the average damage being 2.2 per cent.

Ont.- A trace to 2 per cent of loose smut was reported in 3 fields out of 6 examined in Carleton and Grenville counties.

Loose smut was widespread and prevalent in Middlesex county. (G. C. Chamberlain).

Que.- A trace to 8 per cent of loose smut was observed in spring varieties at Macdonald College. In one field in L'Islet county 15 per cent of the heads were destroyed.

P.E.I.- In a survey of the province the average infection was high, being 22.5 per cent for all varieties grown. The destruction of 20 per cent of the heads was common in Huron and Red Fife in some localities (R. R. Hurst).

BLACK CHAFF - Pseudomonas translucens J.J. & R. var. undulosa (S.J. & R.) Stev.

Sask.- Ninety per cent or more of the leaves were severely affected by a bacterial leaf spot in a plot of Golden Ball at the Experimental Farm, Indian Head. This leaf spot was common and intermixed with Septoria leaf spot on Australian White and Hard Federation. It also caused moderate damage in 5 fields out of 298 examined. This spot is referred, with considerable doubt, to black chaff.

Man.- Black chaff was observed in 10 fields causing slight damage.

BASAL GLUME ROT - Pseudomonas atrofaciens (McCull.) Stev.

Alta.- Basal glume rot was found in 4 fields out of 488 examined. Infection was heavy in one field.

Sask.- Basal glume rot caused a trace to slight damage in

11 fields out of 298 examined

Man.- This disease was found in the following places; Morden, trace; Swan River and Benito, 2 per cent of the plants infected.

ERGOT - Claviceps purpurea (Fr.) Tul.

Alta.- Ergot was found in 6 fields, all in zone 10, out of 488 examined. In one field 80 per cent of the heads contained from 3 to 4 ergots each. In another field in the same district 50 per cent of the heads contained ergots.

Sask.- A trace of ergot was found in 1.4 per cent of the fields examined.

P.E.I.- A trace of ergot was observed in Huron wheat at the Experimental Station, Charlottetown.

POWDERY MILDEW - Erysiphe graminis DC.

Alta.- Traces to light infections were common especially in the northern part of the province.

Sask.- A trace of powdery mildew was seen on Hard Federation at the Experimental Farm, Indian Head.

Que.- Winter wheat was severely infected with powdery mildew at Macdonald College. On June 2, 80 per cent of the plants were infected and at maturity the heads were only half filled.

P.E.I.- Traces of powdery mildew were present on Huron at the Experimental Station, Charlottetown.

GLUME BLOTCH - Septoria nodorum Berk.

Alta.- Glume blotch was found in 26 fields out of 488 examined. Infection was as follows: trace, 12 fields; light, 8; medium, 5; heavy, 1.

Sask.- Glume blotch was observed mostly on prostrate culms, in 28 fields out of 298 examined. The damage was a trace to slight.

N.B.- A trace of glume blotch was found in one field in York county.

P.E.I.- Glume blotch caused slight damage on Huron wheat in Queens county.

SPECKLED LEAF BLOTCH - Septoria Tritici Desm.

Alta.- Speckled leaf blotch was found in 7 fields out of 488

examined, infection being a trace to medium.

Sask.- Speckled leaf blotch was common, but not serious on Australian White wheat at Indian Head.

Leaf spots, the causal organism of which was undetermined, caused a trace to moderate damage in 24 fields out of 298 examined.

FOOT ROTS

As the majority of the plant pathologists, who are working on cereal diseases in western Canada, have agreed that the term "foot rot" is appropriately used for those diseases, which occur on the basal parts of the culm and the adjacent portions of the roots, it will be used here in preference to "root rot". The latter term will be used only for those diseases, which occur exclusively on the roots of cereals.

Alta.- Take-all (Ophiobolus graminis Sacc.) was found in 33.2 per cent or 162 fields out of 488 examined. The average damage in the infected fields was estimated to be 3.3 per cent. The disease was found to be most prevalent and slightly more destructive in zones 9, 10, and 11. However, in most parts of southern Alberta the soil was too dry for typical take-all symptoms to develop and in consequence it may be more prevalent there than these figures indicate.

Foot rot attributed to Helminthosporium sativum Pamm., King & Bakke and Fusarium spp. was found in 48.8 per cent or 238 fields out of 488 examined. It was about equally prevalent in all parts of the province. The average damage in the infected fields was 1.2 per cent. In all fields affected with foot rot, the above organisms were considered to be the cause unless typical take-all symptoms were observed.

Sask.- Take-all was found in 18.1 per cent or 54 fields out of 298 examined. The average damage was usually a trace, but in zone 10 it was slight.

Foot rot due to Helminthosporium sativum and Fusarium spp. was found in 95.7 per cent or 285 fields out of 298 examined. On the average 50 per cent of the plants were infected; the damage was slight to moderate. This disease was widespread in the dry areas, where the actual damage was very difficult to assess.

Prematurity blight (cause unknown) was observed in 10 fields out of 298 examined; the damage was a trace.

Man.- Foot rot caused by Fusarium, Helminthosporium, etc. was found in 87.7 per cent or 135 fields out of 154 examined. Damage was as follows: trace, 33; slight, 69; medium, 22; severe, 11.

Ont.- A sample of Reward wheat grown at Packerham gave a germination of only 60 per cent when it was tested in the Seed Branch Laboratory, Ottawa. Darkened and discoloured seeds were conspicuous in the sample. These were picked out, surface sterilized and plated on agar. None of the seed was free of fungi, 50 per cent yielding Helminthosporium sativum, the rest non-parasitic species as Alternaria, Macrosporium, etc.

BROWNING ROOT ROT - Pythium spp.

Alta.- Browning root rot caused 15 per cent damage in one field in zone 8.

Sask.- Browning root rot was observed in 31 fields out of 298 examined. It was estimated that 10 per cent of the plants were infected, the damage was slight. Pythium oospores were found in the lesions of all specimens examined. In one field at Kinistino (zone 10), 90 per cent of the plants were infected. (H. W. Mead).

Browning root rot was very severe on several summerfallow fields between Environ and Sonningdale. Severely affected fields were also found at Scott, Wilkie, Saskatoon, Dana and Lanigan. In general, browning root rot appeared to be more severe on lighter land than it has for the past few years. Invariably it is worse on wheat on early-ploughed, well-worked summer fallow (T. C. Vanterpool).

Ont.- Durum wheat was found heavily infected with root rot caused by Lagenia radiculicola Vanterpool & Ledingham at Vineland Station on May 27. (J.H.L. Truscott).

HEAD BLIGHT - Giberella Saubinetii (Mont.) Sacc. & Fusarium spp.

Man.- A trace of head blight was seen at Benito and Brandon.

P.E.I.- A moderate infection was noted late in the season on Huron and White Fife at the Experimental Station, Charlottetown.

BRITTLE DWARF - Cause unknown

Sask.- Brittle dwarf was described for the first time in the Canadian Plant Disease Survey for 1931, p.11. This year early in August, it was found in one field each at 3 places in central or southern Saskatchewan as follows: Kindersley, Aberdeen and Balgonie. In each field the damage was a trace. In addition it was common in the Plant Pathology and the Field Husbandry plots at Saskatoon, where it was first observed. Diseased plants occurred most frequently on the edges of the plots.

WHITE TIP - Cause unknown

Sask.- White tip was observed in 3 fields, causing about 10 per cent damage in two. This disease is probably caused by extremely hot weather during the filling of the heads.

SEED INJURY

Sask.- In 2 fields in zone 9, injury apparently due to *Penicillium* spp. was observed on seedlings which were about 4 inches high and one month old. The estimated damage was one per cent.

DROUGHT INJURY OR FIRING

Sask.- Early in July, a survey trip through central Saskatchewan including the districts of Regina, Moose Jaw and Indian Head, revealed a large amount of Drought Injury or Firing of wheat. At about heading time there is a distinct browning and dying of the leaves. The plants are also noticeably retarded. It is caused in all probability by a lack of reserve moisture especially at the lower depths. This trouble is sometimes called browning, but it should not be confused with browning root rot (P. M. Simmonds and B. J. Sallans).

GLUME DARKENING - Cause unknown

Sask.- Glume darkening was observed in Reward at Indian Head.

NEMATODE DISEASE - Heterodera punctata Thorne

Sask.- Slight damage was caused in one field in zone 7 by this nematode.

Aphelenchus avenae Bastian was found as a saprophyte in 11 places in one field near Edmonton.

PHYSIOLOGICAL DISEASES

A memorandum on physiological or mechanical diseases was prepared in June 1932 by Professor T. C. Vanterpool, University of Saskatchewan, Saskatoon, after personal consultation with Prof. W. P. Fraser and Dr. P. M. Simmonds and correspondence with Drs. J. H. Craigie, A. W. Henry and G. B. Sanford. His memorandum has been copied below with some alterations and omissions. In addition to the memorandum, Prof. Vanterpool submitted excellent photographs of straw break and stem kink, which unfortunately cannot be reproduced here.

I Straw Break (Breaking over of Wheat Straw)

Straw Break is characterized by an abrupt breaking over of the culm usually about a half to one inch above the second node.

This break is seldom complete and consequently the plants bend upward almost invariably at the node immediately above the break and ordinarily attains maturity. The heads of affected plants although upright, are considerably nearer the ground, but are nevertheless readily gathered in harvesting operations. On the Canadian prairies, the breaking over occurs after the middle of July and isolated plants scattered throughout the field are affected. A stricken field does not have the appearance of lodged grain. The bends, however, always occur in one direction thereby indicating that strong winds and rain are responsible for the final break, although the primary cause of the weakness in the straw is not known. In some instances foot-rotting fungi may be the indirect cause.

Plants affected with straw break are ordinarily free from any signs of hail damage. However, plants slightly bent over by hail have been found which have regained an upright position in the manner described above.

Straw break is of special interest for many farmers confuse it with hail injury and expect compensation from hail insurance companies when straw break occurs in fields which happen to be insured.

Haskell (1) has described a breaking over of wheat straw which appears to be identical with straw break.

References:

1. Haskell, R. J. Breaking over of wheat straw. U.S.D.A. Plant Disease Reporter 14:157-158. 1930.
2. Canadian Plant Disease Survey Rept. 11:11. 1932.
3. U.S.D.A. Plant Disease Reporter 14:224. 1930 (Apparently straw break and not crinkle joint as reported).
4. U.S.D.A. Plant Disease Reporter Suppl. 81:52. 1931.

II. Stem Kink (Contortion, Krinkle Joint, Crinkle Joint)

Stem Kink was first reported from western Canada as Krinkle Joint (2). It is recognized by a kink, bend, or buckling of the lower internodes of the stem immediately above the nodes, usually above the second. As the plant matures, the stem breaks at this point, the plant falls over and usually produces no grain. It is believed that unfavourable meteorological conditions cause the culm and head to be firmly held in the upper enclosing sheaths, which fail to expand and open normally. On the return of good growing conditions the stem buckles in the region of greatest meristematic activity producing a characteristic kink. It is

possible that much of the crinkle joint of various observers belongs to this category, although stem distortion in the meristematic region may deviate from the type here described. It seems highly probable that the contortion of wheat stems as described from New South Wales (1) is identical with stem kink.

References:

1. Darnell-Smith, G.P. Wheat straw breaking down through "contortion" or the attacks of insects, Agr. Gazette, N.S.W. 25:377-378. 1914.
2. Drayton, F.L. A summary of the prevalence of plant diseases in the Dominion of Canada 1920-1924. Dom. Dept. Agr. Bull. 71 n.s.:9-10. 1926.

III. Distortion and Buckling of the Spike-bearing Internode.

The sheath enclosing the head fails to unroll normally with the result that, as growth continues, there is a buckling of the internode bearing the head, more commonly called the neck, immediately below the head. Distortion of the head also often occurs. The trouble is more common in bearded varieties. Observations made by Mr. B. J. Sallans indicate that the sheath enclosing the head may sometimes fail to unroll on account of being injured by hail. Other adverse meteorological conditions may produce the same effect. Similar distortions have been found where the affected parts contain bacteria. This abnormality also occurs in barley and oats.

OATS

STEM RUST - Puccinia graminis Pers.

Alta.- Stem rust was observed in zones 8 to 10 in 11 out of 152 fields examined. The damage was a trace in 9 fields and light in 2..

Sask.- Stem rust heavily infected oats in the extreme south-eastern part of the province, where the damage was moderate. In other parts of Saskatchewan, infections were light and the damage was a trace to slight. Rust appeared late, during late July and early August in both the south and north. It was collected July 28 on wild oats at Saskatoon.

Man.- Primary infections of stem rust were found on oats on June 29 at Winkler. In general oats was found slightly more heavily infected than wheat in most parts of the province on a survey trip made July 25 to 28. No appreciable damage to the crop occurred except to very late fields, which were few in number.

Ont.- Out of 67 fields examined between Ottawa and Brockville in late July, no rust was found in 22. Traces were abundant near Manotick, Tincap and between North Augusta and Merrickville. Between Carsonby and Becketts Landing, only an occasional field showed rust. Traces of stem rust were present at Franktown and Smiths Falls, while near Kilmarnock rust infection was about 3 per cent.

Que.- Stem rust was first collected on oats on July 25 at Macdonald College. Infection was never more than slight. In Kamouraska county infection was slight. In one field of Alaska, 15 per cent of the stems bore pustules.

N.B.- A trace of stem rust was found in one field in Westmoreland county.

N.S.- A heavy infection of stem rust was observed in Halifax county; in 2 fields in Colchester county infection was slight.

P.E.I.- Traces of stem rust were found on all varieties.

CROWN RUST - Puccinia coronata Corda

Sask.- Traces of crown rust were found in 5 fields out of 77 examined. It was mostly on the lower leaves or in late fields.

Man.- A light sprinkling of crown rust was present as far north as Benito. It caused no appreciable damage. Three pustules of rust were found on a buckthorn hedge at Macdonald on June 23.

Ont.- On a survey trip between Ottawa and Brockville in late July, crown rust was found in 42 fields out of 80 examined. In 29 fields only traces of rust occurred but around Merrickville, Andrews ville and Burritts Rapids, heavy stands especially on the bottom lands near the Rideau river commonly showed infections ranging from 40 to 60 per cent. Escaped buckthorns are plentiful in this area. In one field at North Augusta, 10 per cent of rust was present, but no buckthorn was found. Traces of crown rust were also found at Kilmarnock, Smiths Falls and Franktown.

The following buckthorn plantings were located by personal observation or from information supplied by others and have been examined, except where noted.

(1) Merivale Road, near City View, Carleton Co.: Escaped bushes were noted along the road, but the source was not determined.

(2) Central Experimental Farm, Ottawa: Escaped bushes are common in the Arboretum. Whether they may have escaped from the Arboretum was not determined.

(3) Ramsay Tp. Lanark Co.: Escaped bushes were seen opposite a buckthorn hedge 15 to 20 ft. high growing on a farm on Lot 9, Con. 9. A similar hedge is said to occur on a farm on Lot 11, Con. 8. The actual area, over which buckthorn has here escaped, was not determined.

(4) Town of Perth, Lanark Co.: The original hedge was on what is now the Hospital property. Escaped bushes are extremely abundant in the town, but they may be found in at least three of the adjoining municipalities.

(5) Lanark village, Lanark Co.: A small buckthorn hedge was found on the south side of the village. It has escaped over the neighbouring hillside. Two buckthorns were found on a farm on Lot 6, Con. 11, Drummond Tp. near Lanark village. No escapes were found between the farm and the village.

(6) In the Andrews ville area, a buckthorn hedge was found across the Rideau river in Wolford Tp. Grenville Co. It has spread far and wide on both sides of the river. The presence of escaped buckthorn in this area has made it unprofitable to grow oats on account of the losses from crown rust.

(7) Antrim area, Carleton Co.: Hedges of buckthorn occur on adjacent farms on Lot 11, Con. 6, Fitzroy Tp. The bushes have escaped up to at least $1\frac{1}{2}$ miles from the original plantings. (See 1930 Report).

(8) Eastons Corners, Grenville Co.: A buckthorn hedge was found here. Whether or not the bush has escaped was not determined.

(9) West of Spencerville, Grenville Co., buckthorns have escaped, but this area has not been investigated. Complaints and specimens of heavily rusted oats were sent to the Division of Botany several years ago.

It has been observed personally and reported to me by observers at first hand, that the buckthorn is responsible for serious epidemics of crown rust on oats growing in close proximity to the bush. (I. L. Conners).

Que.- Buckthorns infected with crown rust were observed on June 2, at Macdonald College and vicinity. Aecia were mature on June 16. Only traces of crown rust were found this year at Macdonald college. Usually oats is moderately to severely infected.

N.B.- Victory was moderately infected with crown rust at the Experimental Station, Fredericton.

N.S.- Infections of crown rust ranged from a trace to 5 per cent in infected fields in Colchester, many being free from rust. In Pictou county a trace was found in one field.

P.E.I.- Crown rust was first observed on August 13 at Charlottetown. A survey in early September showed that this rust was widespread in the province and caused slight to severe damage. Buckthorns were moderately infected with crown rust in Queens county.

SMUT - Covered Smut - Ustilago levis (Kellerm. & Swingle) Magn. and Loose Smut - Ustilago Avenae (Pers.) Jens,

Alta.- Covered smut was widespread in Alberta; 23 per cent or 35 fields out of 152 examined were smutty. The average damage was 5.2 per cent in the infected fields or 1.2 per cent loss for all fields. Infections ranging from 25 to 40 per cent were observed in several fields. Loose smut was found in only 5 fields, the highest infection being observed was 3 per cent.

Sask.- Covered smut was found in 29 out of 77 fields examined, the average damage being slight. Loose smut was found in only 2 fields; the average damage was a trace,

Man.- Covered smut was reported from 11 fields, the average damage in the infected fields being 14.4 per cent.

Ont.- In a survey trip from Ottawa to Brockville in late July, smut was found in 57 fields out of 78 examined. In 46 of these fields the species present was recorded; 2.5 per cent of the heads were destroyed by covered smut and 2.7 per cent by loose. The highest infections were: covered smut, 16 per cent; loose, 30 per cent. Smut seemed to be more prevalent between Ottawa and Manotick, than elsewhere.

Que.- About Macdonald College, infections of loose smut varied from a trace to 10 per cent. In Kamouraska county, 5 per cent of loose smut was found in two fields examined and 30 per cent in a third; a trace of covered smut was also found in one field.

N.B.- Banner oats were slightly infected by both loose and covered smuts at the Experimental Station, Fredericton. A specimen of loose smut was also received from Bath.

N.S.- Covered smut destroyed 3 per cent of the heads in one field in Colchester county. Loose smut infections were reported

as follows: in Colchester county, 10 per cent in 3 fields; in Pictou county, 3 per cent in one field.

P.E.I.- Loose smut of oats was general in the province this year. Recorded infections ranged from 5 to 10 per cent.

HALO BLIGHT - Pseudomonas coronofaciens (Ch. Elliott) Stev.

Alta.- Halo blight was reported from 56 fields out of 152 examined. The damage was assessed as follows: trace, 42 fields light, 14. The disease was most prevalent in zones 9 and 10.

Sask.- This blight was found in 3 fields out of 77 examined; 10 to 20 per cent of the plants were moderately affected.

Man.- Halo blight was general at Morden.

Que.- This disease was observed at Macdonald College the last week of May when the plants were 6 to 8 inches high. Infections were slight to moderate.

BACTERIAL STRIPE BLIGHT - Bacterium (Pseudomonas) striafaciens Ch. Elliott.

Alta.- Bacterial stripe blight was found in 58 fields out of 152 examined and is fairly widespread. Damage was reported as follows: trace, 25 fields; light to medium, 33 fields.

Man.- A bacterial leaf disease badly injured the leaves at Winnipeg.

Ont.- Blade blight caused by Phytomonas Avenae (Manns.) Bergey et al, was present on specimens from Sturgeon Falls. The leaves were seriously affected on account of the damage done by secondary fungi (D. H. Jones).

FOOT ROTS

Alta.- Foot rot caused by Fusarium spp. was found in 2 per cent of the fields. Damage was a trace except at Beaverlodge, where it was reported to be heavy.

Sask.- Foot rot attributed to Helminthosporium sativum and Fusarium spp. affected 57 fields out of 77 examined. In the infected fields, 26 per cent of the plants were diseased on the average and the damage was slight.

A trace of prematurity blight was found in 3 fields.

Man.- Helminthosporium-Fusarium foot rot caused very slight

damage in 14 out of 19 fields examined.

N.B.- Foot rot due to Helminthosporium was widespread; the damage was slight.

BLAST - Cause unknown

Alta.- At least a trace of damage from blast was present in all fields examined. Estimated losses of 15 to 20 per cent were observed in a few fields.

Sask.- A trace to slight damage was recorded in 40 per cent of the fields. One field of wild oats near Saskatoon was severely blasted.

N.B.- Blast was widespread; the damage was slight.

P.E.I.- Traces of blast were found at the Experimental Station, Charlottetown.

LEAF BLOTCH - Helminthosporium Avenae Eidam

Alta.- Leaf blotch caused a trace of damage in one field out of 152 examined.

Ont.- Two specimens of an undetermined leaf blight collected in Carleton county in 1930 were found on examination to be affected with leaf blotch. The leaves were severely withered.

P.E.I.- Leaf blotch caused moderate damage to 25 per cent of the leaves in fields in Queens and Prince counties.

SPECKLED LEAF BLOTCH - Leptosphaeria avenaria Webber
(Septoria Avenae Frank)

Que.- Speckled leaf blotch was found on July 14 at Macdonald College. Infection varied from slight to moderate according to the variety and location in the field.

BARLEY

STEM RUST - Puccinia graminis Pers.

Alta.- A trace of stem rust was found in 2 fields in zone 10 out of 75 examined.

Sask.- Stem rust was found in 6 fields out of 27 examined. Damage was moderate in zone 1, nil or a trace in other zones.

Man.- Infections of stem rust varied from 10 to 35 per cent in the Red River valley; the damage was slight.

Ont.- Traces of stem rust were found in late July in 4 fields in Carleton and Grenville counties.

N.B.- A trace of rust was found in 2 fields in York and Sunbury counties.

P.E.I.- Traces to 10 per cent of rust were found at the Experimental Station, Charlottetown.

LEAF RUST - Puccinia anomala Rostr.

Sask.- A trace of leaf rust was present in 3 fields out of 27 examined. It was found rather late in the season on late barley.

Man.- A trace to light infections of leaf rust were found at Ste. Anne des Chênes, Poplar Point and Portage la Prairie.

Ont.- A trace to 10 per cent of leaf rust was found near Burritts Rapids.

Que.- Barley was slightly to moderately infected with leaf rust at Macdonald College.

COVERED SMUT - Ustilago Hordei (Pers.) Kellerm. & Swingle

Alta.- Covered smut was present in 25 out of 75 fields examined. The two highest infections recorded were 30 per cent in a field in zone 8 and 15 per cent in one in zone 11. The average damage in infected fields was 2.9 per cent. Covered smut is thus about one half as prevalent and destructive as it was last year.

Sask.- A trace to moderate infections of covered smut were reported from 4 fields out of 27 examined.

Man.- Infections of 2 and 5 per cent respectively were reported from 2 fields.

Ont.- A trace of covered smut was recorded in 2 out of 3 fields examined in Carleton county.

Que.- A sample of barley seed very heavily inoculated with covered smut was received from a Montreal seed house. It was from

a crop grown this year in the province. Diseased specimens were also received from Timiskaming.

N.B.- Slight infections of this smut were found in all varieties in the test plots at Fredericton.

P.E.I.- In 58 fields examined throughout the province, 4 to 50 per cent of the heads were destroyed by covered smut in the infected fields.

LOOSE SMUT - Ustilago nuda (Jens.) Rostr.

Alta.- Loose smut was found in only 3 fields out of 75 examined. The highest infection was 3 per cent.

Sask.- A trace of loose smut was recorded from 2 fields out of 27 examined.

Ont.- A trace of loose smut was found in one out of 2 fields examined near Ottawa.

Que.- Infections of loose smut varied from a trace to 4 per cent in the different varieties at Macdonald College.

N.S.- Infections ranging from 10 to 20 per cent were reported in 3 fields in Colchester and Pictou counties.

P.E.I.- Infections of loose smut varied from 0.5 to 15 per cent in Queens county.

SPRIPE - Helminthosporium gramineum Rabh.

Alta.- Stripe was reported in 4 fields in zone 10 out of 75 examined. It did very little damage this year, infections ranging from a trace to light.

Sask.- Traces of stripe were found on Colsess barley at Saskatoon and on this and other varieties at Indian Head.

Ont.- A trace of stripe was noticed in one field near North Gower.

Que.- Stripe slightly to moderately infected 6-rowed varieties at Macdonald College.

N.B.- Stripe was widespread on several varieties, but the damage was slight.

P.E.I.- A few to 10 per cent of the plants were found affected in fields in Queens and Prince counties. The average damage was slight.

FALSE STRIPE - Cause undetermined.

Alta.- A trace of false stripe was found in 2 fields.

NET BLOTCH - Pyrenophora teres (Died.) Drechs1.

(Helminthosporium teres Sacc.)

Alta.- Net blotch was present in 28 out of 75 fields examined, it was most prevalent in zones 9 and 10. The damage was estimated as follows: trace, 12 fields; light, 16.

Sask.- Net blotch was found in 11 fields out of 27 examined. The average damage in the infected fields was slight.

Man.- Medium infections of net blotch were found in two fields at Basswood and Poplar Plains.

Ont.- Net blotch was found in 3 fields in Carleton county; 20 to 50 per cent of the leaves were affected, damage being a trace.

Que.- Net blotch severely infected one 2-rowed variety at Macdonald College.

N.B.- A trace of net blotch was found in one field in Doak Settlement, York county.

P.E.I.- Traces of net blotch were found everywhere, but the damage was insignificant.

SPOT BLOTCH - Helminthosporium sativum P.K. & B.

Alta.- Spot blotch was found in 19 fields, chiefly in zone 10, out of 75 fields examined; the damage was a trace in 5 fields and slight in 14.

Man.- Spot blotch was reported from two places, being fairly severe at Souris, and slight at Ste. Anne des Chênes.

Que.- This disease was severe on one 2-rowed variety at Macdonald College.

FOOT ROTS

Sask.- Foot rot attributed to Helminthosporium sativum and Fusarium spp. was found in 23 fields out of 27 examined. In the infected fields over 40 per cent of the plants were attacked; the damage was slight to moderate.

Man.- Helminthosporium-Fusarium foot rot caused slight damage in 14 fields.

N.B.- Foot rot caused by Helminthosporium was widespread, but infection was slight in the plots at the Experimental Station, Fredericton.

P.E.I.- Each year barley is affected by foot rot in the late seedling stage. Although the plants appear to be seriously injured at that time, they generally recover. Fusaria have been isolated from diseased plants.

SCALD - Rhynchosporium Secalis (Oud.) Davis

Alta.- Scald was found in 5 fields in zone 10; the damage was a trace in 2 fields and light in 3.

ERGOT - Claviceps purpurea (Fr.) Tul.

Alta.- A trace of ergot was present in one field.

Sask.- Barley was moderately affected with ergot in one field at Saskatoon.

N.B.- Ergot was present in one per cent of the heads in a field at Fredericton.

P.E.I.- A trace of ergot was found in one field.

POWDERY MILDEW - Erysiphe graminis DC.

P.E.I.- Traces of powdery mildew were recorded on O.A.C. 21 and Duckbill at Charlottetown.

BACTERIAL BLIGHT - Pseudomonas translucens J.J.R.

Sask.- A trace of bacterial blight was found on Colless barley in the Field Husbandry plots, Saskatoon.

BRITTLE DWARF - Cause unknown

Sask.- Brittle dwarf was found for the first time on barley when the disease was observed on Colless in the Field Husbandry

Plots at Saskatoon the first week of August by Messrs. W. G. Sallans and R. J. Ledingham. About 7 per cent of the plants were affected. The symptoms on barley are very similar to those on wheat.

RYE

STEM RUST - Puccinia graminis Pers.

Sask.- Considerable rust was found on late volunteer rye in the Field Husbandry plots, Saskatoon. Traces were found in one field in zone 1.

LEAF RUST - Puccinia dispersa Erikss.

Alta.- A trace of leaf rust was found in one field out of 8 examined.

Sask.- A light sprinkling of leaf rust was observed on July 9 on the experimental plots, Indian Head. In 3 fields out of 8 examined, infection varied from a trace to moderate.

Man.- A trace of leaf rust was recorded from Foxwarren and Morden.

Ont.- Leaf rust was common on lower leaves of rye in Lincoln county; damage was negligible.

Que.- Rye was moderately infected with leaf rust at Macdonald College; damage was slight.

ERGOT - Claviceps purpurea (Fr.) Tul.

Alta.- Ergot was found in 4 fields out of 8 examined. In one field in zone 8 the damage was heavy, as 90 per cent of the heads were infected. Traces only were present in the other fields.

Sask.- Ergot was found in 5 fields out of 8 examined; damage was slight. At the Experimental Farm, Indian Head, 4 to 5 per cent of the heads contained from one to 3 ergots each.

POWDERY MILDEW - Erysiphe graminis Pers.

Ont.- Powdery mildew was common on winter rye in Lincoln county; damage was negligible.

Que.- Moderate infections of powdery mildew were recorded at

Macdonald College, with no apparent damage

BACTERIAL BLIGHT - Pseudomonas translucens J.J.R. var. Secalis
(J.R. & G.) Stapp

Alta.- Bacterial blight caused light damage in one field.

Sask.- A stem streak, possibly due to bacteria, caused slight damage in one field.

FOOT ROTS

Sask.- Foot rot attributed to Helminthosporium sativum and Fusarium sp. was found in 6 out of 8 fields examined. The damage was slight.

Five per cent of the plants in one field were affected by prematurity blight.

Man.- Foot rot caused slight damage in 8 fields examined.

STERILITY

Sask.- Ten to 25 per cent of the heads were sterile in Dakold etc. in the Field Husbandry plots, Saskatoon. This trouble is ordinarily attributed to hot, dry winds at heading time, but such was not true this year. A study of the meteorological and soil conditions at that time suggests that the trouble in 1932 was due to the upper layer of soil being too dry at a critical time for the plant. The majority of the sterile heads were on the shorter and presumably weaker culms. This trouble was also observed on field trips.

II. DISEASES OF FORAGE AND FIBRE CROPS

ALFALFA

COMMON LEAF SPOT - Pseudopeziza Medicaginis (Lib.) Sacc.

B.C.- In some alfalfa fields around Summerland the older foliage was heavily infected with this leaf spot. It was also quite general at Vernon, Kelowna and South Okanagan, especially on old alfalfa cover crops.

Alta.- Medium to heavy infections of common leaf spot were found in 7 fields out of 16 examined; the damage, if any, was very slight.

Sask.- Slight damage was caused by common leaf spot at Indian Head.

Ont.- Traces of this leaf spot were present in the plots at Ottawa.

Que.- Common leaf spot was first observed at Macdonald College, on June 2nd, and nearly every leaf was infected in several plots by August. It caused some defoliation on the lower parts of the plant. This leaf spot was also reported from Kamouraska and Deux Montagnes counties; it caused slight defoliation.

N.B.- Common leaf spot was widespread; the damage was moderate.

N.S.- This leaf spot was quite general, but it was not severe in any field examined.

P.E.I.- Common leaf spot caused moderate infections on alfalfa in Queens and Prince counties; the damage was moderate.

YELLOW LEAF BLOTCH - Pseudomonas Jonesii Nannf.

(= Pyrenopeziza Medicaginis Fuck.)

Nannfeldt has recently published an excellent treatise entitled "Studien über die Morphologie und Systematik der nicht-lichenisierten inoperculaten Discomyceten" (Nova Acta Reg. Soc. Sci. Upsaliensis ser 4, vol. 8, No. 2 pp. 1-368, text fig. 1-47, pl. 1-20. 1932). In this work he has added greatly to our understanding of these fungi. In consequence of his researches he has been compelled to change the names of some of the commoner fungi. Such a change is the one above, but it is proposed to adopt these names in the Survey.

Que.- A slight infection of yellow leaf blotch was observed

on June 2nd; it tended to disappear as the season advanced. A heavy infection was observed in two localities on well-drained and fertilized soils in Rimouski county.

RUST - Uromyces Medicaginis Pass.

Man.- This rust, which appeared in small quantities late in 1931, was not seen this year.

Ont.- Traces of rust were collected in the Forage Division Plots at Ottawa late in the season.

DOWNY MILDEW - Peronospora Trifoliorum de Bary

Ont.- Specimens of alfalfa collected in the Forage Division plots were found to be heavily infected with downy mildew. According to the severity of the disease the varieties were given a rating between 1 and 10 by the Forage Crop Division. The standing was as follows: Nebraska selection, Brooks Grim, Ontario Variegated, 1 (least injured); Ladak, 2; Hardistan, 3; Lytten, 9 (most injured).

FOOT ROT - Sclerotinia Trifoliorum Erikss.

Alta.- Foot rot caused a trace to light damage in 3 fields out of 16 examined. The fungus was found associated with severe winter killing of alfalfa at Brooks.

BROWN ROOT ROT - Plenodomus Meliloti Dearn. & Sanf.

Alta.- A trace to light damage was caused by brown root rot in 5 fields. The fungus was also associated with the severe winter killing of alfalfa, which occurred at Brooks.

MACROSPORIUM LEAF SPOT - Macrosporium sp.

Alta.- A trace to light infection of this leaf spot was reported from 3 fields.

WITCHES' BROOM - Cause undetermined

B.C.- Two-year old alfalfa plants affected with a witches' broom were sent to the laboratory from Smithers and Saanichton. Many small shoots, instead of a few normal ones, arose from the crown. The disease may be important economically (W. R. Foster).

DODDER - Cuscuta epithymum Murr.

B.C.- Dodder was reported from Yale county.

BACTERIAL BLIGHT - Pseudomonas Medicaginis Sackett

Alta.- A light infection of bacterial blight was reported from several fields at Beaverlodge.

COMMON CLOVER

COMMON LEAF SPOT - Pseudopeziza Trifolii (Biv.-Bern.) Fuck.

P.E.I.- All red clover was moderately infected with common leaf spot in Prince, Queens and Kings counties.

MOSAIC - Virus

Que.- Varying amounts of mosaic were present in the different varieties at Macdonald College.

P.E.I.- Four plants were seen in one field of red clover at Charlottetown.

POWDERY MILDEW - Erysiphe Polygoni DC.

Que.- Powdery mildew was general in the Montreal district. It was also general in the eastern part of Quebec; in some fields it was so severe that a small percentage of the leaves shrivelled and dried up.

N.B.- Powdery mildew was widespread; the damage was slight.

N.S.- Red clover was severely infected with powdery mildew in Durham Tp., Pictou Co. This year haying was not completed owing to showery weather, until after the middle of August, a delay of at least 2 weeks. Usually no mildew is found on the first crop.

P.E.I.- Second crop of red clover was severely injured by powdery mildew in Queens, Kings and Prince counties.

RUST - Uromyces Trifolii (Hedw.f.) Lév.

Alta.- White clover was slightly to moderately infected with rust throughout the province.

Que.- A moderately heavy infection of rust was found in Chateauguay county. Slight infections of rust were reported in fields throughout eastern Quebec.

N.S.- Alsike clover was moderately infected in Colchester county. Rust is very common on second crop clover, but it does not appear to cause serious injury.

P.E.I.- Rust was rather abundant on red clover this year in all parts of the province. It apparently caused slight damage. It was also reported on alsike clover from Queens county.

SOOTY BLOTCH - Dothidella Trifolii (Pers.) Bayl.- Elliott & Stansf. (Polythrincium Trifolii Kunze)

N.S.- A trace of sooty blotch was present on alsike clover at Kentville. Red clover was moderately infected in a field in Colchester county.

P.E.I.- Traces of sooty blotch were reported from the Experimental Station, Charlottetown.

ANTHRACNOSE - Kabatiella caulivora (Kirchn.) Karak.
(=Gloeosporium caulivorum Kirchn.)

Alta.- Anthracnose caused slight damage to a field of Alberta Swede red clover at Spruce Grove.

WITCHES' BROOM - Cause unknown

B.C.- Witches' broom produced similar symptoms on clover and was found at the same places as it was on alfalfa (see above).

SWEET CLOVER

MOSAIC - Virus

B.C.- Mosaic was reported from Summerland.

FOOT ROT - Sclerotinia Trifoliorum Erikss.

Alta.- Foot rot caused slight to medium damage in 5 fields in zones 1, 2 and 10 out of 20 examined. Severe killing was produced experimentally at Edmonton.

BROWN ROOT ROT - Plenodomus Meliloti Dearn. & Sanf.

Alta.- A trace to light damage from brown root rot was found in 8 fields in zones 1, 10 and 12.

STEM CANKER - Stagonospora Meliloti (Lasch.) Petr.
(=Ascochyta Meliloti (Trel.) Davis)

Alta.- Stem canker of the Ascochyta Meliloti type caused a trace of damage in 3 fields out of 20 examined. A leaf spot bearing Stagonospora Meliloti was reported in 5 fields; infection was a trace to light except in one field at Athabasca where the plants were moderately infected.

CORN

RUST - Puccinia Sorghi Schw.

Sask.- Corn rust was very severe on the lower leaves of corn in the variety test plots at Indian Head. A trace was found at Imperial. This appears to be the first report of this rust from Saskatchewan.

Man.- A trace of rust was found at Gimli.

Que.- Rust was abundant, the heaviest ever observed, in many fields in Jacques Cartier county. It may have caused some damage. (F. Godbout).

SMUT - Ustilago Zeae (Beck.) Unger

Sask.- A specimen was sent in from Lydden.

Man.- One per cent of the plants was smutted in a field at Winnipeg.

Ont.- Corn smut was noticed in several fields in Lincoln county. The disease was most prevalent on early varieties, where the land was heavily manured. Late field corn was not as severely affected. A specimen was sent to the Division at Ottawa from Blind River.

Que.- A trace of smut was observed in a field of corn in Kamouraska county.

N.B.- A trace of smut was found in a field at the Experimental Station, Fredericton.

N.S.- Traces of corn smut were reported from several places in the province.

BACTERIAL STALK ROT - Bacterium dissolvens Rosen

Alta.- A trace of bacterial stalk rot probably caused by Bacterium dissolvens was found in an Edmonton garden. The

disease was not nearly as prevalent or severe as in 1931.

Ont.- Specimens of this disease were submitted to the Bacteriological Dept., O.A.C. for determination. (D. H. Jones).

FLAX

RUST - Melampsora Lini (Ehrenb.) Desm.

Sask.- A trace of rust was found in one field out of 8 examined.

Man.- Traces of rust were reported from Oak Lake, Jordan and Ste. Agathe.

WILT - Fusarium Lini Bolley

Sask.- A trace of wilt was reported in one field.

HEAT CANKER - Non-parasitic

Alta.- Heat canker caused a trace of damage in one field in zone 3.

BROWNING - Polyspora Lini Laff.

Alta.- Browning was reported from one field in zone 8.

DAMPING OFF - Rhizoctonia sp.

Sask.- A damping off or seedling blight was general in the University plots, Saskatoon, but the damage was a trace. The plants were attacked at the soil level, when they were 3 to 4 inches high. The zone of infection was a half to one inch long. Rhizoctonia only was isolated in pure culture. This seedling blight appears earlier than wilt caused by Fusarium. It has been under observation for 3 years (T. C. Vanterpool).

SUNFLOWER

FOOT ROT - Sclerotinia Sclerotiorum (Lib.) de Bary

B.C.- Foot rot was observed at Saanichton on June 27. Usually several stems were killed in a clump, some clumps being completely destroyed.

RUST - Puccinia Helianthi Schw.

Sask.- Sunflowers were heavily rusted in the University gardens, Saskatoon.

MANGEL

BLACK LEG - Phoma Betae (Oud.) Frank

N.S.- A crown rot caused by Phoma Betae was present in some plots at the Experimental Station, Kentville. It apparently followed tarnished plant bug injury.

SOY BEAN

LEAF SPOT - ?Pseudomonas glycineum Coerper

Sask.- Fifty to 75 per cent of leaves were slightly to severely attacked in a plot at the Experimental Farm, Indian Head.

CULTIVATED GRASSES

BROOM MILLET (Panicum mileaceum)

Smut (Sorosporium Panici-mileacei (Pers.) Takah.) A specimen of this smut was sent to the Laboratory at Saanichton, from a farm at Vernon, B. C.

Six per cent of the heads in three 1/40 acre plots of hog millet were destroyed by smut at Indian Head, Sask.

FOX-TAIL MILLET

Downy Mildew (Sclerospora graminicola (Sacc.) Schroet) Downy mildew caused 2 to 3 per cent damage in a plot of Siberian millet at the Experimental Farm, Indian Head, Sask. Hungarian and common millet did not appear to be infected in the neighbouring plots.

Leaf Spot - A light infection of a bacterial leaf spot was reported from a field near Vermillion.

RED TOP (Agrostis alba)

Stem Rust (Puccinia graminis Pers.) Traces of stem rust were found in Queens county, P.E.I.

TIMOTHY

Stem rust (Puccinia graminis Pers. var. Phlei-pratensis (Erikss. & Henn.) Stakm. & Piemeisel) Stem rust is common on wild

plants throughout Alberta. A medium infection occurred in a field at Barrhead.

A light infection of stem rust was found in Lincoln county, Ontario.

Stem rust was plentiful on timothy throughout Prince Edward Island causing slight to severe damage. Last year the damage was negligible.

Smut (Ustilago striaeformis (West.) Niessl). Timothy was found heavily smutted in Lincoln county, Ontario.

WESTERN RYE GRASS (Agropyron tenerum)

Smut (Ustilago bromivora (Tul.) Fisch. v. Waldh.) Traces to light infections were found at several places in zones 8 and 9 in Alberta. The damage was estimated to be 6 per cent in a field at Vermilion.

Smut was found in 4 fields out of 5 examined in Saskatchewan, causing moderate damage. It is rather common north of North Battleford; several fields were rejected by the Seed Inspection Branch, Saskatoon, on account of smut.

Ergot (Claviceps purpurea (Fr.) Tul.) Fifty per cent of the heads were infected in a field near Drumheller, Alta. It was fairly common on road-side plants everywhere.

LAWN GRASS

Circular areas, where the grass died completely, were observed in a lawn at Charlottetown, P.E.I. An active pathogen was not isolated.

A snow mould (Cause unknown) also attacked bent grass growing in rows at Charlottetown; all plants were killed. (R. R. Hurst)

III. DISEASES OF VEGETABLE AND FIELD CROPS

ASPARAGUS

RUST - Puccinia Asparagi DC.

Sask.- A slight infection in the telial stage was found in the University gardens, Saskatoon on Sept. 19.

Ont.- A specimen of asparagus slightly affected with rust was brought to the Ottawa Laboratory from Eastview on Sept. 19.

Que.- Eighty per cent of the plants were heavily affected with telia in one field at Chateauguay Basin on Sept. 19; 5 to 7 per cent of the plants had been killed back. No rust was found in 6 other fields.

P.E.I.- A trace of rust was reported in one field in Queens county.

BASAL STEM ROT - Fusarium sp.

Sask.- A trace of basal stem rot was found in the Horticultural plots at Saskatoon. One large clump was entirely killed. On August 5 the clump was beginning to turn yellow and by August 29, it was injured beyond recovery. Several other asparagus plants showed symptoms of this rot later in the season.

BEAN

RUST - Uromyces appendiculatus (Pers.) Lév.

N.B.- Rust was severe on one variety of pole beans at the Experimental Station, Fredericton. A specimen of rust was sent to the Laboratory from Edgetts Landing.

P.E.I.- A trace of rust was collected in one field in Queens county.

MOSAIC - Virus

Alta.- A light infection of bean mosaic was observed at Iacombe.

N.B.- A trace of mosaic was found in a garden at Fredericton.

N.S.- Mosaic can usually be found in many of the gardens at Kentville.

P.E.I.- In the experimental plots, Charlottetown, 0.5 per cent of Golden Wax beans were affected with mosaic.

ANTHRACNOSE - Colletotrichum Lindemuthianum (Sacc. & Magn.
Bri. & Cav.

Sask. - Anthracnose was moderately severe in one garden at Indian Head.

Ont. - A moderate infection of anthracnose was reported from Neustadt.

Que. - A trace of anthracnose was present in the different varieties grown at Macdonald College. Infections of anthracnose varied from slight to 75 per cent in farm gardens in L'Islet and Kamouraska counties; in one field over 50 per cent of the crop could not be sold. In 4 one-half acre fields in Portneuf county, 25 per cent of each field was severely infected, while the rest of the field was very slightly diseased.

N.B. - Anthracnose was widespread in the province; the damage was severe in private gardens in Fredericton.

N.S. - Light infections of anthracnose were noted at Kentville and Middleton.

P.E.I. - On all garden varieties infections of anthracnose varied from a trace to heavy; the damage was slight to severe in each of the three counties, in many fields the plants being completely destroyed.

BACTERIAL BLIGHT - Pseudomonas Phaseoli E.F.Sm.

Alta. - Susceptible varieties were found moderately to severely damaged at Brooks, Lethbridge, Olds, Lacombe and Edmonton.

Sask. - Bacterial blight was found in the Field Husbandry plots at Saskatoon on several varieties including Carleton and Norwegian. It was also observed in a city garden at Saskatoon and at Maryfield.

Man. - Bacterial blight was found at Killarney.

Que. - Slight to moderate infections of bacterial blight were present on the different varieties at Macdonald College and vicinity. It was first observed on June 23 and increased in severity as the season advanced. In some varieties 50 per cent of the pods were moderately diseased. The amount of blight seemed to be associated with the source of the seed. In L'Islet, Quebec and Kamouraska counties the disease was general this year wherever beans were grown; in one field 100 per cent of the plants were affected.

N.B.- Bacterial blight caused moderate damage to several varieties of beans in gardens at the Experimental Station, Fredericton and at the Dominion Seed Testing Laboratory, Saskville.

N.S.- This disease was very common at Kentville and elsewhere; it caused severe damage in a few small plantings.

P.E.I.- Traces only of bacterial blight were observed in Queens county.

DRY ROOT ROT - Fusarium Martii App. & Wall. var. Phaseoli Burkh.

Alta.- Dry root rot attributed to the above Fusarium caused severe damage in patches in fields at Brooks.

WILT - Sclerotinia Sclerotiorum (Lib.) de Bary

N.B.- Severe damage was caused by wilt in two gardens in Fredericton.

WILT - Botrytis cinerea Pers.

Alta.- A pathogenic strain of Botrytis cinerea was isolated, by the Dominion Laboratory, Edmonton, from diseased plants sent from Lethbridge.

BROAD BEAN

STEM ROT

Sask.- Broad bean plants affected by a stem rot were sent from Togo, Sask., to the Dominion Laboratory, Saskatoon. The bases of the stems were dark and decayed and were covered with bacterial ooze. No definite organism was isolated, but it is thought the disease was caused by bacteria.

BEET

SCAB - Actinomyces scabies (Thaxt.) Gussow

P.E.I.- One per cent of the roots were affected by scab in a garden in Queens county.

LEAF SPOT - Cercospora beticola Sacc.

N.B.- Leaf spot was widespread, but caused slight damage.

P.E.I.- Leaf spot was common and of varying intensity in all gardens in Queens county, but the damage was insignificant.

CABBAGE

CLUB ROOT - Plasmodiophora Brassicae Woron.

B.C.- In fields totaling 20 acres in area at Keating, 75 per cent of the cauliflower and 62 per cent of the cabbage were affected with club root. Similarly in some fields at Victoria, cabbage and other crucifers were practically worthless on account of this disease. The plants were infected in the seed bed, before they were transplanted. A severe infection of Chinese cabbage (Brassica pekinensis Rupr.) occurred in a Chinese garden near Vancouver. This disease is on the increase as several severe infestations have been reported on cabbage and cauliflower in Chinese truck gardens near Vancouver and New Westminster. The disease was also reported on cabbage at Armstrong.

Ont.- A cabbage root affected with club root was sent to the Ottawa Laboratory from Ferris.

P.E.I.- One per cent of the plants of Danish Ballhead were affected with club root in a garden in Queens county.

BLACK ROT - Pseudomonas campestris (Pamm.) E.F.Sm.

Ont.- Black rot caused moderate damage to cabbage and cauliflower at Newmarket and severe damage at Dundas. Cabbage heads in storage were found severely damaged by black rot at Guelph in January.

P.E.I.- Black rot destroyed 0.5 per cent of heads in a garden at Charlottetown.

BLACK LEG - Phoma Lingam (Tode) Desm.

B.C.- Black leg was reported as quite common on cabbage, but kohlrabi was free from the disease at Prince George. The damage was severe. The soil was a silty loam of pH 7.

CANTALOUPE

INTERNAL BREAKDOWN - Non-parasitic

B.C.- Internal breakdown was quite prevalent in Yale county this year.

SCAB - Cladosporium cucumerinum Ell. & Arth.

Ont.- Scab severely infected cantaloupe in a field in Lincoln county, killing the young terminal growth.

BACTERIAL WILT - Bacillus tracheiphilus E.F.Sm.

Ont.- Wilt infected 8 per cent of the Honey Rock melons in a field in Norfolk county. It was also noticed in Wentworth county.

LEAK - Mucor curtus Berk. & Curtis

B.C.- Practically all the fruit in a carload from Yale county was affected with leak when the car reached Vancouver. Apparently during transit the temperature was too high inside the car. (G. E. Williams).

CARROT

YELLOW - Virus

N.B.- Ninety per cent of the carrots were affected with yellows in a two-acre field in Sunbury county; 5 per cent were similarly diseased in a garden at Fredericton.

CAULIFLOWER

CLUB ROOT - Plasmodiophora Brassicae Woron.

B.C.- (See the note on this disease under cabbage).

Ont.- Cauliflower was moderately infected with club root in a field in Lincoln county. In a garden in Toronto all plants except 3 failed to head on account of club root.

P.E.I.- One per cent of the plants were infected with club root in a garden at Charlottetown.

BACTERIAL LEAF SPOT - Pseudomonas maculicola (McCull.) Stev.

Alta.- A medium infection of bacterial leaf spot was found at the Experimental Station, Lacombe.

DOWNY MILDEW - Peronospora parasitica (Pers.) Tul.

B.C.- Fifty per cent of the plants of Dwarf Early Erfurt were affected in a outdoor seed bed in North Saanich Tp., Vancouver island.

BLACK ROT - Pseudomonas campestris (Pamm.) E.F.Sm.

Ont.- (See the note on this disease under cabbage).

CELERY

LATE BLIGHT - Septoria Apii Chester

B.C.- Late blight severely infected celery in a field in Saanich Tp., Vancouver island. The disease was checked by applications of Bordeaux. Late blight was also reported from Armstrong.

Ont.- Late blight caused by Septoria Apii var. graveolentis Derokin was prevalent and severe on unsprayed blocks of Paris Golden in Lincoln county.

P.E.I.- Late blight caused moderate to severe damage in commercial gardens in Queens county.

EARLY BLIGHT - Cercospora Apii Fres.

Ont.- A specimen of celery affected with early blight was sent to the Ottawa laboratory from Bishops Mills. The correspondent writes "This is the third year for this trouble. Eventually the leaves become yellow or brown spotted and even the stem 'melts down'".

BLACK HEART - Cause unknown

Ont.- A slight infection of black heart was reported in Lincoln county.

P.E.I.- Black heart is an exceedingly serious disease of celery in commercial gardens. The disease was also seen at the Experimental Station, Charlottetown, this year. All early varieties are apparently susceptible (R. R. Hurst).

SOFT ROT - Bacillus carotovorus L.R. Jones

Ont.- In a field in Waterloo county, 30 per cent of the crop was destroyed.

N.B.- Soft rot caused slight damage in a garden in Fredericton.

DROP - Sclerotinia Sclerotiorum (Lib.) de Bary

N.B.- A trace of drop was found on celery in a garden in Fredericton.

CUCUMBER

SCAB - Gladosporium cucumerinum Ell. & Arth.

Ont.- Specimens of cucumber affected with scab were sent from Port Credit to the Ottawa Laboratory by J. C. Shearer, Agricultural Representative.

B.B.- Scab was widespread and in most fields the damage was severe.

N.S.- Scab was widespread in the province and serious in many small gardens. A grower in Kings county brought specimens to the Kentville laboratory. He estimated that he had lost 50 per cent of his crop.

P.E.I.- Scab caused severe damage in Queens and Kings counties and moderate in Prince; considerable loss was sustained by commercial growers. This is the first report of this disease in Prince Edward Island.

BACTERIAL WILT - Bacillus tracheiphilus E.F.Sm.

Ont.- Ten per cent of the plants were affected with wilt in a field in Wentworth county.

The disease caused severe damage at Watford, Wolverton and at the Experimental Farm, Ridgetown. At the last place the plants were grown in a greenhouse and the crop was almost a total loss. (D. H. Jones).

DAMPING OFF - Pythium de Baryanum Hesse

N.B.- Ninety per cent of the plants were destroyed by damping off in a garden in Fredericton.

EGG PLANT

LEAF SPOT - Alternaria Solani (Ell. & Martin) Jones & Grcut

N.S.- A bed of about 50 egg plants was affected at Kentville with a leaf spot. The Alternaria present agree microscopically with A. Solani (K. A. Harrison).

WILT - Verticillium sp.

Ont.- Wilt was prevalent in a field of New York Purple in Lincoln county.

N.S.- Egg plant and okra sent from Pictou to the Ottawa Laboratory were found to be affected with wilt. The grower stated

that several plants were affected.

HOP

DOWNY MILDEW - Pseudoperonospora Humuli (Miyabe & Tak.) Wils.

B.C.- Downy mildew was general on hops in the Fraser River valley. Owing to high precipitation during the summer months, infection was heavy in the Cluster variety. Considerable infection occurred in the "bur" and early cone stages; infection of the mature cones was checked during the dry weather. Slight infection of the cones was present in Kent Golding at Agassiz. No cone infection was observed in Fuggles.

INFECTIOUS CHLOROSIS - Virus

B.C.- Two virus diseases of hops not previously recognised in British Columbia were found in 1932. They are infectious chlorosis and nettlehead. These diseases have been reported in England.

Infectious chlorosis was present in the Golding and Fuggles varieties. About 0.5 per cent of the plants of the former variety were found infected in one hop yard in 1932. The reduction in yield was apparently negligible. As a preventative measure the growers are gradually roguing out plants showing the disease.

On casual observation the majority of affected plants do not appear to be different from normal healthy ones. However, they are usually lighter green in colour and possibly weaker in growth. In typically diseased plants, the leaves are distorted and puckered, generally rolling downwards irregularly. They may also show large blotchy primrose yellow areas of different shapes. These areas may be circular and "ribbony" margined with a green centre or horse-shoe shaped; they may be scattered over the leaf area or aggregated to form irregular blotches extending outwards along the veins. In severely diseased plants, where puckering and distortion of the leaves are present, the blotchy primrose yellow areas are generally found at the base of the leaf and along the veins.

In Fuggles, a variety with harsh textured foliage, diseased plants bear "rusty" appearing leaves. Examination of these rusty leaves has shown that the chlorotic areas had become rusty brown and brittle. This brittle tissue breaks away easily from the green part; the leaves appear punctured and have the appearance similar to those injured by the hop flea beetle. This symptom of infectious chlorosis is quite prevalent in Fuggles in the Fraser River valley.

NETTLE HEAD - Virus

One plant of the Fuggles variety showing definite symptoms of nettle head was observed in the Fraser River valley. This disease is more serious than infectious chlorosis, as the affected plants remain barren or produce a few malformed hop cones. As the name implies, plants affected with this disease resemble, in a general way, the common nettle.

CROWN GALL - Pseudomonas tumefaciens (Sm. & Towns.) Duggar

B.C.- Crown gall was observed on the roots of several hop plants in the Fraser River valley. According to one grower this disease is fairly general. The yield obtained from affected plants is apparently not reduced.

KOHLRABILEAF SPOT - Alternaria Brassicae (Berk.) Sacc.

Alta.- A light infection of leaf spot was present in a garden near Edmonton.

LETTUCEDROP - Sclerotinia Sclerotiorum (Lib.) de Bary

Alta.- Drop caused severe damage to head lettuce at Lethbridge, Lacombe and Edmonton. In one field 80 to 100 per cent of the heads were a total loss. The sclerotia of Sclerotinia Sclerotiorum were not always found in rotted heads.

TIP BURN - Non-parasitic

B.C.- Tipburn is a limiting factor in the production of lettuce in the Okanagan valley. Varieties otherwise desirable, such as New York, produce a crop, which is largely unmarketable on account of this disease.

RUST - Puccinia patruelis Arth.

Man.- Many plants of cultivated lettuce were marked by conspicuous aecial spots of this rust in the Kildonan district.

ONIONNECK ROT - Botrytis Allii Munn

B.C.- Fifteen per cent of the onions shipped from Armstrong

district to Vancouver were lost due to neck rot. It affected about 20 per cent of the crop in a field of White Portugal. It was also reported from Kelowna.

N.S.- Less than one per cent of the onions were affected with neck rot in a garden at Kentville. A few diseased specimens were received from affected gardens.

BULB ROT - Fusarium sp.

B.C.- Bulb rot caused an average loss of 5 per cent of the crop at Kelowna.

SMUT - Urocystis Cepulae Frost

Man.- Onion smut occurred in small amounts in the Kildonan market gardens. It is never a serious disease in Manitoba.

SMUDGE - Colletotrichum circinans (Berk.) Vogl.

N.S.- Smudge was stated to be common on onions in storage, which had been grown at the Experimental Station, Kentville.

PEA

POWDERY MILDEW - Erysiphe Polygoni DC.

B.C.- Powdery mildew was general and severe at the Experimental Station, Saanichton.

N.B.- This disease was widespread, but the damage was slight. At the Experimental Station, Fredericton, it severely infected all plants seen.

Que.- Powdery mildew developed to a slight extent, late in the season in Gaspé, but caused no apparent damage.

P.E.I.- Peas were moderately infected with powdery mildew in Queens county. This disease was also reported from Kings and Prince counties.

DOWNY MILDEW - Peronospora Viciae (Berk.) de Bary

B.C.- Downy mildew was prevalent on peas in the Fraser River valley. From 20 to 30 per cent of the plants were infected in some fields.

Que.- Downy mildew occurred to a slight extent in Gaspé. It

developed late in the season and caused no apparent damage.

LEAF AND POD SPOT - Ascochyta Pisi Lib.

B.C.- This disease was fairly common at Saanichton but the damage was slight.

Alta.- Leaf and pod spot was very severe in some gardens at Olds, Lacombe and Edmonton.

Que.- Leaf and pod spot and Mycosphaerella blight (see below) were by far the most important diseases on Tall Telephone peas in Gaspé in 1932. Due to the similarity in the symptoms of these two diseases, it is often extremely difficult to tell them apart in the field. Accordingly no effort has been made to assess the losses due to each, but they appeared to be of equal importance. This year the average loss for the district was estimated to be 50 to 60 per cent of the crop and infection varied from 25 to 100 per cent in every field. Higher humidities and lower temperatures are thought to be responsible for the higher infection this summer.

The two fungi causing these diseases have been found to be the chief causal agents of the severe rotting of peas in storage or transit.

In experiments to control these diseases in the field, Bordeaux Mixture 4-4-40 with Resin Fish Oil added as a sticker increased the yield from 38.5 per cent in the check to 77.6 per cent in the treated plots. Six applications were made at irregular intervals depending on the time at which rain fell.

Seedling blight due to Ascochyta spp. caused some reduction in germination and stand of plants. (E. Lavallée)

This spot was general on leaves and pods in Kamouraska county, but the disease was not severe.

N.B.- Leaf and pod spot caused slight damage in the gardens at the Experimental Station, Fredericton, and the Dominion Seed Testing Laboratory, Saskville.

N.S.- Peas in the experimental garden at Kentville were moderately infected with leaf and pod spot.

P.E.I.- This disease was moderately destructive after the crop matured.

MYCOSPHAERELLA BLIGHT - Mycosphaerella pinodes (Berk. & Blom.)
Stone (Ascochyta pinodes L.K. Jones)

Que.- This disease is discussed along with that caused by Ascochyta Pisi. L.K. Jones (N.Y. Agr. Exp. Stat. Bull. 547, 1927) reports the isolation of Ascochyta Pisi, A. pinodes and A. pinodella L.K. Jones, from pea seed from eastern Canada. The last named organism causes a foot rot in peas.

BACTERIAL LEAF SPOT - Pseudomonas Pisi Sackett

Sask.- Field peas were moderately infected with bacterial leaf spot at Indian Head. The spots were chiefly on the lower leaves and stipules. They were rounded to irregular, dark brown at the margin, lighter towards the centre and translucent.

MOSAIC - Virus

N.S.- A heavy infection of mosaic was observed in the variety plots at Kentville. In some varieties 70 per cent of the plants were affected.

RUST - Uromyces Fabae (Pers.) de Bary

Que.- Peas were slightly to severely damaged by rust at Macdonald. The damage was reported as follows: very severe on Laxtons Progress; severe on Blue Bantam; moderate on Price of Wales, Laxtoniam and Telephone; slight on Thomas Laxton and Horal; and none on Onward.

LEAF BLOTCH - Septoria Pisi West.

Alta.- A medium infection of leaf blotch was present in a garden near Edmonton.

WIND INJURY

N.B.- Several varieties of peas were severely damaged by wind in the experimental plots, Dominion Seed Laboratory, Sackville.

POTATO

As in previous years Mr. Tucker, Chief Potato Inspector, has kindly supplied a summary of the prevalence of disease in fields of potatoes inspected for certification throughout Canada. These fields were grown from certified seed. Of the fields inspected 2,520 or 28.2 per cent failed to pass inspection on account of disease, etc., a considerable increase over last year's figure of 2,176 fields or 19.3 per cent rejections. Mosaic was responsible

for this marked increase in rejections as 56.9 per cent of the fields rejected contained too high a percentage of mosaic. The greater amount of mosaic observed this year was probably due to the season being cooler and therefore more favourable for the detection of the disease than the past two seasons have been. It may be expected that the percentage of fields rejected on account of disease will again fall next year. The percentage of rejections due to other diseases were as follows: black leg, 7.4 per cent; leaf roll, 4.6 per cent; adjacent to diseased fields, 9.5.

LATE BLIGHT - Phytophthora infestans (Mont.) de Bary

B.C.- Late blight was very prevalent in the Fraser valley during the growing season, the tops being seriously damaged in many fields. Dry weather prevented much tuber infection late in the season.

Que.- Late blight was severe throughout the province, the tubers rotting badly. It was estimated that the yield would be reduced by 30 bu. per acre.

N.B.- Late blight was widespread and severe.

N.S.- Late blight infection was slight in Kings county and westward, while it was severe in the eastern part of the province especially in Colchester and Cumberland counties. In well-sprayed fields in Colchester county good control was obtained. Tuber rot was correspondingly higher in these two counties, the average being 3 per cent.

P.E.I.- Late blight was severe, causing a great reduction in yields throughout the potato growing section. Where spraying was done carefully, blight was scarcely noticeable, but where the plants were poorly or not sprayed, great quantities of tubers rotted in the field or later in storage.

In greenhouse tests using Irish Cobbler and Green Mountain set rot was induced with P. infestans.

RHIZOCTONIA - Corticium Solani (Prill. & Del.) Bourd. & Galz.
(Rhizoctonia Solani Kühn)

B.C.- Rhizoctonia was very general throughout the province and a fairly high percentage of the tubers were unmarketable.

Alta.- The damage from rhizoctonia was estimated in August as follows: severe in 7.5 per cent of the fields; moderate in 24.2 per cent, slight in 61.8 per cent and none in 6.5 per cent.

N.B.- Rhizoctonia was widespread, but the damage was slight. It was estimated that 8.5 per cent of the tubers were affected in 797,000 bushels examined.

N.S.- Rhizoctonia was most severe in Kings county where 40 per cent of the tubers in one bin were infected and the average infection was 12.0 per cent. In the other countries the average infection ranged from 5.6 to 1.0 per cent.

P.E.I.- Rhizoctonia was most prevalent on Irish Cobblers, it occurred in decreasing amounts on Green Mountain, Bliss Triumph and Spaulding Rose.

COMMON SCAB - Actinomyces scabies (Thaxt.) Gussow

B.C.- Common scab was not severe on the general crop in British Columbia.

N.B.- Common scab was widespread and severe in limited areas; 2.3 per cent of the tubers were scabby in 797,000 bushels examined.

N.S.- Scab was not as prevalent as rhizoctonia. It was most prevalent in Kings county, where as high as 15 per cent of the tubers were infected in one bin and the average for 44 bins was 3 per cent. In the other counties, the average percentage of tubers infected ranged from 2.6 to 0.3 per cent.

P.E.I.- At the Experimental Station, Charlottetown, the maximum number of tubers infected in any experiment was 100 per cent in Irish Cobbler, 50 per cent in Green Mountain, 25 per cent in Bliss triumph and 5 per cent in Spaulding Rose.

BLACK LEG - Bacillus phytophthorus Appel

B.C.- Black leg was present in many fields in the Fraser valley. In some fields infection was heavy, in others slight. Six fields grown from certified seed were rejected on account of black leg.

Alta.- Forty fields out of 219 fields grown from certified

seed contained black leg. The average damage was 0.2 per cent.

N.B.- Black leg was common in Carleton, Restigouche, Victoria and York counties.

N.S.- Black leg was found in small amounts in practically all counties, but it was most prevalent in Cumberland county. Infection ranged from 0 to 3.3 per cent in the individual fields.

P.E.I.- Black leg was not an important disease in 1932. Irish Cobblers and Green Mountains showed infections 0.5 and 0.1 per cent respectively.

EARLY BLIGHT - Alternaria Solani (Ell. & Martin) Jones & Sprot

B.C.- Early blight was general in potato fields, particularly those situated on the Lower Mainland. Damage was slight.

Man.- Early blight caused slight damage in a field at Penito.

N.B.- Although early blight was widespread the damage was slight.

N.S.- Early blight was general. It caused the early death of the vines of Irish Cobblers in eastern Fictou, Cumberland and the valley district of Kings counties and reduced the yield by at least 25 per cent.

P.E.I.- Early blight was most prevalent on early varieties, especially Irish Cobblers. It is estimated that it caused a loss of 10 per cent of the crop.

LEAF ROLL - Virus

B.C.- A high percentage of the plants were affected with leaf roll in some fields in the Fraser valley. Nine fields grown from certified seed were rejected on account of leaf roll.

Alta.- Leaf roll was present in 65 fields out of 219 inspected. The average damage was 0.13 per cent.

N.B.- Leaf roll was common in Carleton, Restigouche and York counties. The average infection was 0.07 per cent.

N.S.- Leaf roll affected 2 to 8 per cent of the plants in

individual fields. The average infection varied from 0.5 per cent in Cumberland to 0.06 per cent in Halifax.

P.E.I.- Leaf roll was recorded in the following varieties in the plots at Charlottetown: Irish Cobblers, 0.1 per cent; Green Mountain 0.5 per cent; Bliss Triumph, 2.0 per cent.

MOSAIC - Virus

B.C.- Mosaic was fairly common in British Columbia although the percentage of plants infected was not high. Very little rugose mosaic was present. Forty-three fields from certified seed were rejected on account of mosaic.

Alta.- Mosaic was present in 32 out of 219 fields inspected. The average infection was 0.14 per cent.

Que.- Mosaic was more prevalent this year than it has been for many years past and was found in all parts of Quebec.

N.B.- Mosaic was widespread. The average infection was 1.6 per cent.

N.S.- The 3 highest average infections of mosaic were 1.6 per cent in Halifax and Hants counties and 1.5 per cent in Digby. In the other counties the percentage of mosaic was materially less. The highest individual infection was 20 per cent.

P.E.I.- In the experimental plots, Charlottetown, mosaic infections were reported as follows: Irish Cobbler, 2 per cent; Green Mountain, 2; Bliss Triumph, 5; and Spaulding Rose, 15.

SHOE STRING MOSAIC - Virus

Que.- An occasional plant affected with shoe string mosaic was found in several counties.

WITCHES' BROOM - Virus

B.C.- Witches' broom was reported in a few fields in the lower Fraser valley and in the Interior. The percentage in any field was not high.

Alta.- Witches' broom was found in 10 fields out of 219 inspected. The two highest infections were 0.6 and 0.3 per cent respectively.

N.B.- A trace of witches' broom was found in Bliss Triumph grown from imported seed.

P.E.I.- All the plants were affected with witches' broom in a 1/80th acre plot at Charlottetown. The plants were pulled up and destroyed. The seed came from British Columbia.

SPINDLE TUBER - Virus

N.B.- Spindle tuber occurred only in Carleton and Westmoreland counties. The average percentage was 0.1 per cent.

P.E.I.- Traces of spindle tuber were found in Irish Cobblers.

STEM-END HARD ROT - Phomopsis tuberivora Gussow & Foster

B.C.- A new disease of potato named stem-end hard rot (1) was found in 1930 on several varieties including Irish Cobbler, Green Mountain, Early Ohio and Bliss Triumph. It was observed on Vancouver island and in the Fraser valley. It has not been reported from any sections of the interior. The causal organism was found to be a new species, Phomopsis tuberivora Gussow & Foster. (2)

DRY ROT - Fusarium spp.

N.B.- Dry rot was widespread; the damage was slight, 0.6 per cent of the tubers showing dry rot in 797,000 bushels inspected in September.

P.E.I.- Dry rot caused serious storage losses. At the Experimental Station, Charlottetown in March, the dry rot present was as follows: Green Mountain, 0.1 per cent; Irish Cobbler, 1.0; Bliss Triumph, 0.5; Spaulding Rose, 1.5.

FUSARIUM WILT - Fusarium oxysporum Schlecht.

Que.- Wilt appears to be spreading in Quebec, In some fields

(1) Foster, W. R. & MacLeod, H.S. A new stem-end rot of potato. Can. Journ. Research 7:520-523, pl.1, text fig.10. 1932.

(2) Gussow, H. T. & Foster, W.R. A new species of Phomopsis Can. Journ. Research 7:253-254, pl.1-2, text fig. 5. 1932.

in Temiscouata county, 50 per cent of the plants were affected and the tubers also showed soft rot.

SILVER SCURF - Spondylocoladium atrovirens Harz

N.B.- In September 0.1 per cent of the tubers were affected with silver scurf in 797,000 bushels inspected.

P.E.I.- Traces of silver scurf were detected by Nov. 1, in Irish Cobblers. Potatoes in storage inspected on March 25, showed an abundant development of silver scurf causing some injury to the "eyes".

POWDERY SCAB - Spongospora subterranea (Wallr.) Lagerh.

N.B.- Powdery scab was found only in Carleton and Restigouche counties. Of the total crop, 0.2 per cent of the tubers were affected.

N.S.- Out of 24 lots of Garnet Chili examined in October, 22 were free from powdery scab. In the other 2 lots, one and two per cent of the tubers respectively were affected.

P.E.I.- Powdery scab caused slight to severe damage in the eastern part of the province. Infection ranged from a trace to 25 per cent in Bliss Triumph and Irish Cobblers. Traces of powdery scab were observed in Green Mountains. The blisters remained unbroken although the spore-balls formed in masses under the skin.

PHOMA ROT - Phoma tuberosa Melhus, Rosenbaum & Schultz

N.B.- A trace of Phoma rot was found in York county.

P.E.I.- A survey of stored potatoes showed this disease to be active where powdery scab was present. Phoma rot renders the tuber useless for seed and is responsible for considerable losses in storage.

GIANT HILL - Virus

B.C.- Giant hill is apparently on the increase particularly in Netted Gem and Burbank. It was found in most sections of the province; 15 fields from certified seed were rejected on account of this disease.

NET NECROSIS - Cause undetermined

N.B.- A trace of net necrosis was found in seed stock of Green Mountain at the Experimental Station, Fredericton.

LEAF AND STEM NECROSIS - Cause undetermined

N.B.- A trace of a type of necrosis resembling that described by Quanjor as "acropetal necrosis" was found in one field of Irish Cobbler in York county. The necrosis was chiefly in the collenchyma of the veins of the leaves, petioles and stems.

BICHLORIDE INJURY

P.E.I.- Injury occurs annually to seed potatoes where they are improperly treated by the mercury bichloride method.

SOFT ROT OR LEAK - Pythium sp.

B.C.- A species of Pythium has been constantly isolated from a soft rot, which has been found affecting cut sets in the early spring immediately after they have been planted, but which had also been found in potato tubers during harvesting and in storage. This rot has been observed on the Lower Mainland and on Vancouver island. It is believed that this Pythium is the initial cause of decay of the seed pieces in early spring and the subsequent rot of the seed piece results in many misses.

LEAF SPOT - Botrytis sp.

N.B.- A trace of a leaf spot caused by Botrytis sp. was found on Green Mountains at the Experimental Station, Fredericton.

STEM ROT - Botrytis sp.

P.E.I.- Fifteen per cent of the plants were infected with a stem rot in a half acre field of Green Mountain in Queens county. The affected plants died. The plants were growing on poor soil and were not thrifty. The fungus was probably a weak parasite.

BLACK DOT - Colletotrichum atramentarium (Berk. & Br.) Taub.

Sask.- Black dot was found on the tops of Early Ohio in April in a garden at Saskatoon. It is estimated that 3 per cent of the hills had been attacked. In the fall of 1931, the potatoes were harvested before the foliage had dried out to any extent in order to avoid frosts. No black dot was observed at that time.

P.E.I.- Black dot was found heavily infecting the dead stems of Irish Cobblers in March.

FLEA BEETLE INJURY

N.B.- Flea beetle injury on potato tubers was widespread, but the damage was slight. It was observed on Bliss Triumph, Green

Mountain and Irish Cobbler. The lenticels showed punctures of the beetles filled with starch, but at the time the trouble was first detected a definite core of suberized tissue about the puncture was not always present. In consequence at first it was difficult to determine the cause.

RHUBARB

CROWN ROT - Cause unknown

Sask.- Crown rot was reported from Lawson, Rosthern and Saskatoon. Ruby and Macdonald, especially the former, are very susceptible to the disease.

LEAF SPOT-- Ascochyta Rhei Ell. & Ev. and Phyllosticta stramineella Bres.

Sask.- A trace of Ascochyta leaf spot was found at Indian Head.

P.E.I.- Leaf spots caused by both the above organisms were observed in Queens county.

LEAF SPOT - Cause unknown

Sask.- A leaf spot of unknown cause was found at Wilkie and Saskatoon. The spots were small, 1-4 mm. across, scattered all over the leaf. The centre was greyish or light-coloured with red to purple margin. On the petioles, long sunken spots were numerous. No evidence of a fungus was found by microscopic examination. These symptoms are quite distinct from those produced by crown rot.

SALSIFY

ROOT ROT - Sclerotinia Sclerotiorum (Lib.) de Bary

N.S.- Roots of salsify affected by this rot were collected at Kentville and brought to the laboratory for examination.

SPINACH

DOWNY MILDEW - Peronospora effusa (Grev.) Rabh.

B.C.- Spinach was severely infected with downy mildew in a vegetable garden at Saanichton.

Man.- Downy mildew was found on spinach near Winnipeg.

Que.- Downy mildew caused some damage to spinach in Laval county in September. It causes some loss every year, the time

when the disease is destructive varying with the weather conditions. It was less destructive this year than last.

ROOT ROT - Fusarium sp.

Ont.- Five per cent of the plants were affected with root rot in a field in Welland county. The diseased plants matured early and died; the tap root was completely destroyed. Fusarium sp. was isolated from affected plants.

SUGAR BEET

CROWN GALL - Pseudomonas tumefaciens (Sm. & Town.) Duggar

B.C.- Crown gall was reported on sugar beet from Summerland.

ROOT ROT - Cause undetermined

Alta.- Root rot caused a trace of damage in two field in zone 2.

Man.- Sugar beet seedlings were killed in some instances by a root rot near Emerson; isolations gave a Fusarium, which Dr. Gordon found to belong to the F. gibbosum group

SWEET CORN

COMMON SMUT - Ustilago Zeae (Beckm.) Unger

Alta.- A trace of smut was found on sweet corn at Brooks.

Que.- A trace to 10 per cent of the ears were destroyed by smut in 15 fields of sweet corn examined in the Montreal district. The disease is frequently reported by gardeners.

N.S.- Corn smut appears to be increasing slightly in prevalence. It was present in the experimental plots at Kentville and diseased specimens were received from scattered points in the province.

P.E.I.- Smut caused a trace of damage in a plot of Golden Bantam in Queens county.

BACTERIAL WILT OR STEWART'S DISEASE - Bacterium Stewartii (E.F.Sm.)
Stev.

Ont.- Bacterial wilt or Stewart's disease of sweet corn was

recognized in Canada for the first in 1932. Severe outbreaks of the disease occurred in Essex, Kent and Norfolk counties, while scattered infections were found in Elgin, Huron, Lambton, Brant, York, Middlesex, Halton, Wentworth and Lincoln counties. In the counties, where the disease was prevalent, the damage was severe, some fields being a total loss. The disease was most severe on sweet corn, but it was also observed on field corn and once on pop corn. (G. C. Chamberlain)

Bacterial wilt was also very prevalent in Illinois, Ohio, Pennsylvania and other states in the United States, where it had been observed previously, but it was also found in several states such as Connecticut, where it had never been noticed before.

TOBACCO

The information reported below was compiled by Mr. R. A. Bothroyd, Tobacco Division, Ottawa.

(1) Seed-Bed

DAMPING-OFF - Pythium de Baryanum Hesse

Much damage was reported in the Farnham district, Que., and in the l'Assomption area where the seedbeds were sown too thickly. Very few cases were reported in south-western Ontario.

BLACK ROOT ROT - Thielavia basicola Zopf

A few isolated cases were reported from the Farnham district, Que., but in l'Assomption-Montcalm 40-50 per cent of the plant beds were affected to a greater or lesser degree. The disease was general on Burley tobacco in the Ontario district, with most damage occurring at Malden, around Chatham and east of Blenheim.

SEEDBED MOULD - Pyronema confluens (Pers.) Tul.

One or two cases reported in the Farnham district, Que., Formaldehyde (1:1,000) used as seedbed control.

(2) Field

BLACK ROOT ROT - Thielavia basicola Zopf

Numerous cases were reported in the Quebec districts, and considerable damage was caused by the disease in south-western Ontario. In this area the varieties Judy's Pride and Kelly were most adversely affected, but due to a hot spell after planting, a

remarkable recovery was noticed in other varieties.

WILDFIRE - Pseudomonas tabacum (Wolfe and Foster) Stev.

A number of plants, notably of the Belge varieties, were affected with this disease at the Central Experimental Farm, Ottawa, Ont. In the commercial districts only one case was reported from Farnham, Que. This crop was ploughed under.

ANGULAR LEAF SPOT - Pseudomonas angulata (Fromme & Murray) Stev.

No cases were reported from the Farnham district, Que., and less damage than usual resulted from this disease in the l'Assomption-Montcalm area. In the New Belt of south-western Ontario many mature crops were infected, one case at Teeterville showing 75 per cent infection. A correlation appeared to exist between the amount of precipitation and wind and the severity of infection.

MOSAIC - Virus

Heavy infections were reported from l'Assomption, Que., and south-western Ontario; less mosaic was observed in the Farnham area than usual. The mature leaves of infected plants showed severe damage, though there were signs of recovery in many cases following topping. In a number of fields in the l'Assomption district, infestations ran as high as 60 per cent. At the Central Experimental Farm, Ottawa, Ont., percentage of infection was very low.

FRENCHING - Nitrogen deficiency

In the Old Belt of Ontario, in fields, where drainage was temporarily restricted, considerable frenching occurred, notably in the Windham district.

PHYSIOLOGICAL LEAF SPOTS

A few fields in the New Belt of Ontario, particularly in the vicinity of Vittoria and Teeterville, showed considerable spotting.

WIND & HAIL

Hail damaged a strip of about 200 acres of Burley tobacco in the vicinity of Cedar Springs and Blenheim, Ont. High winds did slight damage around Albana and Blythwood, Ont., during the second week of August.

IMMATURE SUN-YELLOWING & FIRING

This condition was quite prevalent in the Old Belt of Ontario, especially on the variety Standup Resistant when grown on light, gravelly soils and spring-ploughed fields.

(3) Curing Barn

POLE BURN

Slight damage was reported in some localities in the province of Quebec.

TOMATO

BLOSSOM-END ROT - Non-parasitic

Que.- In one field in Montmagny county, 10 per cent of the fruit were affected with this disease. It was reported to have been destructive on tomatoes under glass at Lachine during the past two years.

P.E.I.- Blossom-end rot was observed in both 1931 and 1932 in Queens county. This year it was found both in the greenhouse and the field.

MOSAIC - Virus

Ont.- Ninety per cent of the plants were affected with mosaic in a greenhouse crop of Lloyds Forcing and Grand Rapids varieties at Grimsby. Twenty-five per cent of the plants were infected and severely stunted by mosaic of the shoe-string type in a field of Earliana in Wentworth county. John Baer was similarly affected, but less severely.

P.E.I.- Infections varying from a trace to 10 per cent were observed in tomatoes in the field and greenhouse in Queens county.

STREAK - Virus

B.C.- Streak was severe in some greenhouses on Vancouver island; in some the crop was a total loss.

LEAF MOULD - Cladosporium fulvum Cke.

B.C.- Leaf mould was a very common disease in 5 greenhouses

out of 8 visited, around Victoria. Where the plants were heavily infected, the damage was considerable.

N.B.- Leaf mould was severe at the Experimental Station, Fredericton.

EARLY BLIGHT - Alternaria Solani (Ell. & Martin) Jones & Grout

B.C.- Four consignments of tomatoes from 4 different growers on Mayne island, one of the Gulf Islands, contained 20, 23, 30, and 44 per cent of the fruit respectively showing black spot, when they were inspected by the Dominion Fruit Inspector, 4 days after shipping, although all fruit was said to have been unblemished when packed. On field examination it was found that the leaves bore blight infections, varying from a trace to 100 per cent, which resulted in almost complete defoliation of the vines while practically all the fruit were spotted. An occasional stem canker was also found. The fungus was isolated repeatedly from the fruit. (J.W. Eastham)

P.E.I.- Early blight caused a trace to 10 per cent infection in a field of tomatoes in Queens county.

LEAF SPOT - Septoria Lycopersici Speg.

B.C.- Leaf spot was prevalent on Earleana and John Baer varieties in a field in Wentworth county. The damage was slight.

Que.- Leaf spot had moderately infected several varieties at Macdonald College by September 15, and caused some defoliation. The disease was not as serious as it was last year when the vines were almost defoliated by the above date.

LATE BLIGHT - Phytophthora infestans (Mont.) de Bary

P.E.I.- Several varieties were badly affected with late blight in the variety tests at Charlottetown. Some of the fruits rotted in the field and practically the entire crop was affected, the diseased tissue subsequently breaking down rapidly.

BACTERIAL SPOT - Pseudomonas vesicatoria (Doidge) Stapp

Ont.- An outbreak of bacterial leaf spot occurred on several farms near Harrow and caused considerable damage to the early fruit, 90 per cent of the fruit being infected. It caused slight damage also at Picton and St. Catharines.

WILT - Verticillium sp.

B.C.- In a greenhouse at Victoria, wilt caused nearly 100 per cent damage; Verticillium was isolated from the diseased stems that were plated.

Ont.- Verticillium wilt caused the death of plants in a garden in Middlesex county.

SPOTTED WILT - Virus

Sask.- Thirty plants affected with what appeared to be spotted wilt out of 550 plants were removed from the University plots, Saskatoon, on July 22, but several taller and more recently affected plants were left. On August 8, a few of these diseased plants showed typical fruit spotting. (T. C. Vanterpool)

This is the first report of this disease to the Plant Disease Survey. For a description of the disease see, Samuel, G. et al. Council Sci. Indust. Res. Australia, Bull. 44. 1930. Doolittle and Summer report the finding of this disease in Wisconsin in 1930. (Phytopath 21.106. 1931).

TURNIPCLUB ROOT - Plasmodiophora Brassicae Woron.

N.B.- Club root was widespread and destructive. Infection ranged from 2 to 100 per cent in 37 gardens examined; the damage was estimated to be \$15,000.00.

N.S.- Bangholm was completely destroyed by club root in the test plots at Kentville. In Colchester county, 25 per cent of the crop was destroyed by this disease; in 5 other fields the crop was free from infection.

P.E.I. - Club root was common in all parts of the province. At the Experimental Station, Charlottetown, infection varied from a trace to 100 per cent, resulting in total loss of the crop in some plots. Club root developed on turnips growing on land which had produced a disease-free crop in 1931.

BROWN HEART - Non-parasitic

Que.- Brown heart was found at Macdonald College on several

selections of Bangholm Sludsgaard and Pajbjerg varieties; 40 to 100 per cent of the plants were affected, the damage ranging from slight to severe.

N.B.- Brown heart was widespread and destructive; the loss was estimated at \$25,000.00. Eighty-five to 100 per cent of the turnips were affected at the Experimental Station, Fredericton.

P.E.I.- A trace to high percentage of the turnips were affected with brown heart in every county. Contrary to previous observations, all varieties did not appear to be equally affected.

BLACK ROT - Pseudomonas campestris (Pamm.) E.F.Sm.

P.E.I.- Traces of black rot were present in Queens and Prince counties.

STORAGE ROT - Corticium Solani (Prill, & Del.) Bourd. & Galz.
(Rhizoctonia Solani Kuhn)

P.E.I.- This rot caused annually appreciable losses in storage.

WILT - Sclerotinia Sclerotiorum (Lib.) de Bary

N.S. - At the Experimental Station, Kentville, 30 per cent of roots were affected with wilt in a field on which sunflowers had been grown previously and had been affected with this disease. A few stalks of seed turnips were also wilted in a field in Cape Breton.

DRY ROT - Phoma Lingam (Tode) Desm.

P.E.I.- Dry rot infections were usually heavy in all 3 counties. It was found on Hasgards Improved. Halls Westbury and Bangholm.

DAMPING OFF - Cause undetermined.

N.B.- Fifty per cent of the plants were destroyed in one field near Sackville.

VEGETABLE MARROW

WILT - Sclerotinia ?Sclerotiorum (Lib.) de Bary

Man.- Wilt affected vegetable marrow at Birtle

TRANSPORTATION DISEASES

The following observations were made by Mr. A. Cannadine of

the Can. Pacific Railway Company at Saskatoon and communicated by Dr. P. M. Simmonds. They represent observations made on cars of vegetables received and inspected there.

CABBAGE - Decay in cabbage was chiefly due to soft rot (Bacillus carotovorus L. R. Jones) and to an unidentified leaf spot, possibly bacterial leaf spot (Pseudomonas maculicola (McCull.) Stev.).

CUCUMBER - Decay was present only when the cucumbers were over-ripe and the tissue broken down.

LETTUCE - Some loss occurred from red heart, a red discolouration starting at the stem end of the lettuce, and tip burn.

POTATO - The loss in potatoes was chiefly due to soft rot (Bacillus phytophthorus Appel) dry rot (Fusarium spp.), black heart and frost injury.

TOMATO - Considerable loss is occasioned by "bacterial spot" (?Pseudomonas vesicatoria (Doidge) Stapp), and by breakdown due to shipping immature or over-ripe fruit. From two carloads showing disease on arrival at Montreal, samples were sent to Ottawa. Anthracnose (Colletotrichum phomoides (Sacc.) Chester) was found on the fruit from the car originating in the West Indies and Phoma rot (Phoma destructiva Plowr.) in the one from Texas.

WATERMELON - Anthracnose (Colletotrichum lagenarium (Pass.) Ell. & Halst.) caused some damage.

No diseases were noted in carrots and celery.

IV. DISEASES OF FRUIT CROPS

APPLE

SCAB - Venturia inaequalis (Cke.) Winter
Eusicladium dendriticum (Wallr.) Fuck.

B.C.- The perfect stage of the fungus was found fruiting on dead twigs of Winter Banana on Apr. 9, at Saanichton. The ascospores were being discharged at that time.

In the Kootenay Lake district Mr. J.W. Eastham has kindly given the results of counts on unsprayed trees: McIntosh at Willow Point, of 1,300 apples on the tree, 1,151 or 87.1 per cent were scabby; McIntosh near Nelson, of 358 apples, 98.8 per cent were scabby; Cox Orange at Queens Bay, of 19 apples, 37 per cent scabby; Rome Beauty, of 271 apples, 90.8 per cent scabby. At Willow Point considerable loss occurred from "pin-head" scab on sprayed trees. It developed on the apples just before they were picked and to some extent afterwards, while they were still in the packing house. In the sprayed plots of Cox Orange at Queens Bay, 3 trees bore 453,447 and 435 apples respectively, which suggested that the set of fruit has been greatly reduced by scab.

In the Salmon Arm district, the sprays were generally not applied early enough and the rainfall was unusually heavy in the spring. In consequence, apple scab was serious, the losses aggregating at least \$10,000. At Vernon in some orchards scab caused slight damage, while in others it was severe. It was also reported from Armstrong, Enderley and in the south Okanagan. In the latter district it is very rare.

Ont.- In Lincoln county apple scab appeared in epidemic form this year. In some orchards the crop was a total loss. McIntosh, Greening and Palwin were by far the most susceptible varieties. In one orchard of McIntosh under observation, the following data were collected: sprayed trees, July 15, 7.3 per cent of the foliage and 1.7 per cent of the fruit infected; Sept. 21, at harvest time, 61 per cent of the fruit infected; unsprayed trees, July 15, 86.8 per cent of the foliage and 96.8 per cent of the fruit infected; Sept. 1, 100 per cent of the foliage and fruit infected. Conditions were especially favourable for late midsummer infection. First ascospore discharge was recorded on Apr. 13; free discharge on Apr. 18. In Western Ontario scab was generally prevalent, but in the Georgian Bay and Northumberland districts the disease was not severe (G.C. Charberlain).

Que.- Apple scab was prevalent again in 1932 on McIntosh and Fameuse in Western Quebec. Last spring perithecia were very numerous in most orchards. Mature perithecia were found about May 1,

a few days later than in 1931. The first ascospore discharge, however, occurred only about May 20 and scab infections were found on June 5.

In contrast to the spring of 1931, no sepal infection occurred. Primary infection was also less common. In the majority of well-sprayed orchards, where the 5 sprays advised by the "Quebec Spray Service" had been applied, very little scab was present except in the tops of trees. But in August there appeared many new infections which were followed by heavy outbreaks of pin-head infection in September. This fall, the only scab-free orchards were those, which had been very thoroughly sprayed in the spring. In unsprayed orchards, 90 per cent of the fruit were scabby (F. Godbout).

In eastern Quebec apple scab heavily infected the fruit in unsprayed orchards, the crop being a total loss in most localities. First ascospore discharge was noted at Ste. Anne de la Pocatière on May 23 and primary scab infection was observed on the leaves on June 11. In the experimental orchard, fruit infection was as follows: Duchess, 0.06 per cent, Salome 1.0; Wealthy, 1.5; Melba, 3.8; Fameuse, 7.7; McIntosh, 11.4, and St. Lawrence, 12.5 (C. Perrault).

N.B.- Scab caused only slight damage on the Experimental Station, Fredericton. Unsprayed trees (check) of McIntosh and Fameuse were only slightly infected with scab.

N.S.- Apple scab was generally light in well sprayed orchards. Some late infection appeared on winter varieties and was severe in some orchards, 40 to 50 per cent of the fruit being affected. The late infection was probably spread by the heavy gale on Sept. 17. (J.F. Hockey)

P.E.I.- Scab was readily kept in control, where the orchards were properly sprayed. It was observed in the 3 counties on several varieties.

FIRE BLIGHT - Bacillus amylovorus (Burr.) Trev.

B.C.- A light blossom infection of fire-blight was observed at Summerland and Penticton, principally on Jonathan, King and Spitzenburg varieties.

Sask.- Twig infections of fire-blight were observed in the University orchards, Saskatoon. Bacterial exudate was abundant; the damage was nil. This appears to be the first report of this disease for Saskatchewan.

Man.- A specimen affected with fire-blight was received from Morden at the Ottawa laboratory.

Ont.- In Lincoln county, fire-blight was observed several times. It appeared to be more prevalent than usual. It also caused moderate damage in orchards at Gananoque and Galt.

Que.- Fire-blight was prevalent throughout the province in 1932, being more widespread than in 1931. It was less severe in the Rougemont, St. Hilaire, Oka and St. Joseph du Lac districts, while there was an increase in the Abbotsford, Chateauguay, Hemmingford, Franklin Centre and Montreal Island districts. It was present in Portneuf, Quebec and Levis, L'Islet and Kamouraska counties, being severe in one orchard at Village des Aulnaies, L'Islet county. The disease occurred almost entirely as twig infections. Blossom infection was observed on some Alexanders and Fameuse trees at Abbotsford, and on some Fameuse trees at Hemmingford. On the whole, little damage was caused.

BLACK ROT - Physalospora malorum Shear
(Sphaeropsis malorum Pk.)

Ont.- A scattered infection of black rot was observed in a block of Greenings in Lincoln county.

Que.- Black rot slightly infected leaves of several varieties especially Alexander at Macdonald College. A trace was found on the fruit of the same variety at Chateauguay. Traces of black rot are found on the fruit every year especially in neglected orchards.

N.S.- A trace of black rot was found on the fruit in an orchard in Kings county.

P.E.I.- A very severe leaf spot infection of black rot was present on wild trees at Marshfield. The disease was very common this year.

CORKY CORE - Physiological

Que.- On about 12 trees of McIntosh, a few to 60 per cent of apples were affected with corky core at Macdonald College.

N.S.- About 4 per cent of fruit were affected with corky core in certain fertilizer plots at Kentville. It was found only in

McIntosh trees growing on soils which have received much lime and phosphate, but little nitrogen.

DROUGHT SPOT - Physiological

B.C.- Drought spot as well as corky core and die back increased in prevalence and spread to orchards not previously affected in the Okanagan valley. It is probably the most important disease in this region. As the fruit are usually unsaleable the losses this year were very heavy. In one orchard where a careful estimate was made, the loss was assessed at 25 per cent of the crop.

Que.- Drought spot affected 80 per cent of fruit on two trees of Fameuse and a slight amount occurred on several others at MacDonald College. The same trouble is also present at Oka (see 1931 Survey, p. 62).

RUST - Gymnosporangium spp.

Ont.- Three leaves fairly heavily marked by rust were sent from Campbellford to the Ottawa Laboratory. Puccinia only were present. A specimen of red cedar bearing telia of Gymnosporangium Juniperi-virginianae Schw., was sent from Morpeth.

Que.- A special survey of the prevalence and distribution of rust on apple was made in eastern Quebec. The only species of rust affecting apples observed in this district was Gymnosporangium clavipes Cke. & Pk. (G. germinale (Schw.) Kern). In sprayed orchards rust was scarce, but in neglected orchards or on wild trees, as high as 80 per cent of the fruit have been found affected. The disease was present through the region and although it does not cause appreciable loss to the growers, it is increasing slowly from year to year. Some varieties such as Wolf River, St. Lawrence and Wealthy appeared to be more susceptible than others. The symptoms also varied with the variety, but on all varieties observed, the part invaded by the rust mycelium took on and kept a deep green colour. Early varieties such as Montreal Peach, Yellow Transparent, etc. are rarely found affected; on other varieties rust infections may be found, but the later the variety the later it is in the season before the rust appears. At best, aecia were only imperfectly formed at anytime, which suggests that the apple is not a congenial host for this year.

On Amelanchier both G. clavipes and G. clavariaeforme (Jacq.) DC. were found in abundance. All the bushes were severely infected along the roadsides and in the fields and woods. Fifty to 100 per cent of the fruits were infected, both species of rust being common, while 10 to 25 per cent of the leaves were infected

with G. clavariiforme. Infection on the Amelanchier was observed early in July, five weeks to two months before it could be detected on apple.

Gymnosporangium clavipes was also found on Crataegus, but much less frequently than on Amelanchier; 5 to 20 per cent of the fruits were infected.

Gymnosporangium Juniperi Lk. (G. cornutum (Pers.) Arth.) was found on Sorbus americana. All trees examined bore some infected leaves. No infection was observed on the fruit. The aecia matured from 4 to 8 weeks after the other rusts.

Juniperus communis var. depressa the alternate host of these 3 rusts, grows extensively from Lewis to Rimouski (C. Ferrault).

Specimens of the three rusts on their respective hosts, of apple, Amelanchier, Crataegus and Sorbus sent by Mr. Ferrault confirm the above findings. In addition, Professor Campagna sent specimens of the telia of all three on J. communis var. depressa besides aecia on the above mentioned hosts. He also sent aecia of G. clavipes on Aronia melanocarpa. Near Brightonville the aecia of G. clavipes were found in abundance on the fruits of most Crataegus species. On some bushes, of evidently a different species, the new shoots were badly infected, so much so that the bushes were stunted and bore no fruit. Aecia were rather scattered on these. Leaves on some species showed a few infections, but development had ceased after the pycnia were formed and the diseased tissue was dead at the time of examination (I. L. Connors).

POWDERY MILDEW - Podosphaera leucotricha (Ell. & Ev.) Salm.

B.C.- Powdery mildew was general, but the infection was light at Saanichton. It was very prevalent in some sections of the Okanagan valley. By marking the fruit it caused considerable loss this year.

Ont.- Powdery mildew was prevalent on the new growth in an orchard in Lincoln county; the foliage was somewhat dwarfed and the new growth stunted.

N.S.- Powdery mildew was reported on seedlings at Kentville.

ANTHRACNOSE - Penicillia mali-corticis (Jacks.) Mannf.

(Cryptosporiosis mali-corticis (Cordley) Mannf.

B.C.- Cox's Orange Pippin was severely infected with anthracnose at Saanichton. The disease is increasing slightly in prevalence in the Salmon Arm district.

CROWN ROT - Non-parasitic

B.C.- Crown rot was reported as follows: Summerland, still prevalent and severe in many orchards; Penticton, no great increase, but still very prevalent; Westbank, increasing in prevalence; North Okanagan, not as prevalent as in the South Okanagan, but still severe.

Ont.- Crown rot was prevalent in a block of Northern Spy in Peel country; the affected trees were dying. In an orchard of Gravenstein, Ontario, McIntosh and Duchess in Lincoln county, 60 per cent of the trees are affected with crown rot. The damage was severe; practically all the Duchess were dead and many trees had one half of three quarters of the trunk girdled.

TWIG BLIGHT - Nectria cinnabarina (Tode) Fr.

N.S.- A light infection of twig blight was found on Rome Beauty and Ben Davis in two orchards at Kentville. The disease is conspicuous, but not serious; it follows, frequently, injury to the fruit spurs at picking time.

SOOTY BLOTCH - Gloeodes pomigena (Schw.) Colby

N.S.- A trace of sooty blotch was present in sprayed orchards in Kings county, while 100 per cent of the fruit were infected on wild trees.

FLY SPECK - Leptothyrium Pomi (Mont. & Fr.) Sacc.

N.S.- In neglected orchards in Kings county, 100 per cent of the fruit were infected, while in sprayed orchards, a trace was present on fruit near the ground.

ROT - Hypholoma appendiculatum (Bull.) Fr.

B.C.- A rot caused by the above species was reported from Penticton.

PINK ROT - Tricothecium roseum Lk.

Ont.- Pink rot was found in Lincoln county in orchards where scab was severe.

P.E.I.- Pink rot heavily infected Fameuse apples that were scabby in Queens county; the damage was severe.

SILVER LEAF - Stereum purpureum (Pers.) Fr.

N.S.- Silver leaf has been very scarce the past few years,

but it is again appearing on occasional trees. It was observed in 3 orchards of 5 to 8 year old trees.

BITTER PIT - Non-parasitic

B.C.- Bitter pit was reported from the southern Okanagan valley.

N.B.- Bitter pit was found scattered throughout the province but it was most prevalent on light soils. In some orchards up to 50 per cent of the apples were affected and on individual trees all fruit was injured; the varieties were Wellington, Stark, Wolf River, Blenheim, Twenty-ounce Pippin and Balwin.

SUN SCALD - Non-parasitic

Ont.- A few of the exposed apples were affected with sun scald in a block of Greening in Lincoln county. The loss was negligible on account of the heavy crop.

BROWN ROT - Sclerotinia americana (Worm.) Nort. & Ezekiel

Ont.- A light infection of brown rot was present in a block of Pippin in Lincoln county. It appeared that the rot followed insect punctures.

JONATHAN SPOT - Non-parasitic

B.C.- Jonathan spot was reported from the south Okanagan valley.

CROWN GALL - Pseudomonas tumefaciens (Sm. & Towns.) Duggar

B.C.- Crown gall was reported to be widespread in an orchard in the south Okanagan valley.

N.S.- A single seedling was found infected with crown gall in Kings county.

PERENNIAL CANCER - Gloeosporium perennans Zeller & Childs

B.C.- Very few new infections of perennial canker developed this year in southern Okanagan valley. In old cankers further spread was controlled to a considerable degree.

FROST INJURY

N.S.- Two moderate to severe frosts were experienced in May.

The first occurred when the buds were at the pre-pink stage and the second when the blossoms were about one third open. These frosts caused a total loss of crop in some orchards; the leaves were curled and the blossoms dropped. Fruit bud formation was good on these trees during the summer.

HAIL INJURY

N.S.- A hail storm caused severe cutting and marking of the fruit on about 100 acres of orchard land in Kings county; the fruit were severely reduced in grade.

APRICOT

BLIGHT - Clasterosporium carpophilum (Lév.) Aderh.
(= Coryneum Beijerinckii Oud.)

B.C.- Fruit were sent in to the Provincial Laboratory profusely spotted with reddish sunken spots from the Lillooet district. The correspondent stated that the fruit had been unsaleable for the past 3 years. Typical spores of the fungus were found in the lesions. This is, I believe, the first authentic record from the interior of British Columbia, although the disease is known at the coast both at Vancouver and near Victoria. It is, however, of negligible importance so far. (J.W. Eastham)

DROUGHT SPOT - Non-parasitic

B.C.- A slight amount of drought spot was present in all districts of the south Okanagan valley. The Blenheim variety was most susceptible.

BLACKBERRY

ORANGE RUST - Gymnoconia Peckiana (Howe) Trotter

Ont.- This disease was frequently found in plantations in Lincoln county; 10 per cent of the young canes were attacked in a plantation of Eldorado.

Que.- Orange rust was observed in Laval, Chateauguay and Rouville counties; the damage was negligible. A specimen was also received from Ste. Agathe des Monts; the spores germinated by a germ tube.

P.E.I.- Wild blackberries infected with orange rust were found in all 3 counties.

BLUEBERRY

CROWN GALL - Pseudomonas tumefaciens (Sm. & Towns.) Duggar

B.C.- A specimen affected with what appeared to be crown gall was found on one plant of the Harding variety on Lulu Island. The plants were originally from New Jersey.

CHERRY

SHOT HOLE - Higginsia hiemalis (Higg.) Nannf.
(Cylindrosporium hiemalis Higgins)

Ont.- Shot hole was very prevalent and severe causing practically complete defoliation of young trees of both sweet and sour varieties in a nursery in Welland county.

N.S.- Shot hole caused severe defoliation of sweet cherry trees in the Bear River district; good control was obtained in sprayed orchards.

P.E.I.- Shot hole caused severe damage to sweet, sour and wild cherries in Queens county. The leaves were decidedly yellowed as well as showing the usual symptoms. (R.R. Hurst.)

BROWN ROT - Sclerotinia americana (Worm.) Nort. & Ezekiel

B.C. - In 1928 in the Kootenay Lake district, a considerable amount of brown rot was found on sweet cherries, as high as 20 per cent of the fruit being affected on individual trees. This was the first brown rot noticed in this important cherry area. It was recognized that the rot was different from that in the Fraser valley, where the latter is destructive every season. No further specimens were found until this year, when a little was observed although the injury was not important commercially. From a cultural study of the isolated organisms it seems certain that the Kootenay species is Sclerotinia cinerea Schroet. S. cinerea also causes a destructive blossom blight around Victoria, but this injury has not been noticed in the Kootenays. (J. W. Eastham)

N.S.- Fifteen per cent of the crop was destroyed by brown rot in the Station orchard, Kentville.

BLACK KNOT - Dibotryon morbosum (Schw.) Theiss & Syd.

Black knot was reported as common on wild cherries in Quebec, New Brunswick, Nova Scotia in Prince Edward Island.

WILT - Verticillium sp.

Ont.- Fifteen per cent of the sweet cherry trees were affected

and dying from wilt in an orchard in Lincoln county.

WINTER INJURY - Non-parasitic

Ont.- Seventy-five per cent of the trees of Schmidt sweet cherry showed winter injury in an orchard in Lincoln county. Sunken areas in the bark were found girdling the trunks and limbs with abundant gumosis. Affected parts were dying or dead, but few trees will succumb. The soil was stoney and damp with a south-west exposure. Black Tartarian showed resistance. The injury probably took place in the winters of 1929 and 1930.

DIE-BACK - Non-parasitic

B.C.- Die-back was more prevalent this year in all the cherry growing districts of the south Okanagan valley.

FRUIT SPLITTING - Non-parasitic

B.C.- The splitting of the fruit at harvest time considerably reduced the amount of marketable fruit in the southern Okanagan valley.

CURRENT

WHITE PINE BLISTER RUST - Cronartium ribicola Fischer

Ont.- White pine blister rust was severe in all plantings of black currants in Lincoln county, causing defoliation. It was also severe in one plantation in Peel county.

Que.- This rust was severe causing defoliation by Sept. 15, at Macdonald College. The rust was found on most wild currant bushes examined in early summer, and severe defoliation of cultivated currant occurred in many places in the Montreal district in the fall.

N.B.- White pine blister rust was widespread on both wild and cultivated species of currants.

N.S.- This rust moderately infected a small plantation in a farm garden in Halifax county.

P.E.I.- White pine blister rust was prevalent in the 3 counties of the province on both cultivated and wild Ribes. It caused moderate to severe defoliation of black currant late in the season.

SEPTORIA LEAF SPOT - Mycosphaerella Grossulariae (Fr.) Lindau
(Septoria Ribis Desm.)

Sask.- A few leaves were moderately infected with Septoria leaf spot in the University gardens, Saskatoon; 40 to 50 per cent of the leaves were similarly affected at the Experimental Farm, Indian Head.

P.E.I.- A very heavy infection of Septoria leaf spot was found in a garden in Queens county, Sept. 11.

ANTHRACNOSE - Dipranopeziza Ribis (Kleb.) v. Höhn.
(Gloeosporidiella Ribis (Lib.) Petr.)

Alta.- A heavy infection of anthracnose was observed on red currant in a garden at Edmonton.

Sask.- Anthracnose caused 75 to 90 per cent defoliation of red and white currants by July 22 at the Experimental Farm, Indian Head. Black currants and gooseberries nearby were unaffected.

P.E.I.- Anthracnose caused a trace to moderate infections in Queens and Prince counties.

POWDERY MILDEW - Sphaerotheca mors-uvae (Schw.) Berk. & Curt.

Alta.- Medium to severe damage was caused by powdery mildew in 2 gardens in Edmonton. Light damage was also reported on Viking.

Sask.- A heavy infection of powdery mildew was observed on the upper young leaves and stems of black currant at the University gardens, Saskatoon.

GOOSEBERRY

ANTHRACNOSE - Gloeosporidiella Ribis (Lib.) Petr. f. sp.
Grossulariae (Kleb.) Nannf.

B.C.- Anthracnose was reported from Sorrento.

Sask.- The lower leaves on the bushes were moderately infected with anthracnose causing slight defoliation in the University gardens at Saskatoon.

P.E.I.- Anthracnose moderately infected the gooseberries in a garden in Queens county.

SEPTORIA LEAF SPOT - Mycosphaerella Grossulariae (Fr.) Lindau
(Septoria Ribis Desm.)

Sask.- Septoria leaf spot was common, but caused slight damage at Indian Head.

Ont.- This leaf spot was prevalent in one garden in York county.

POWDERY MILDEW - Sphaerotheca mors-uvae (Schw.) Berk. & Curt.

B.C.- Powdery mildew was very destructive in all districts in the southern Okanagan valley, especially on European varieties. It was also reported to be severe at Summerland and Lytton.

Sask.- Powdery mildew was severe at Rosthern. Specimens were received from Gillespie.

CLUSTER CUP RUST - Puccinia Pringsheimiana Kleb.

N.S.- Specimens heavily infected with this rust were sent from Amherst to the Kentville laboratory.

GRAPE

BLACK ROT - Guignardia Bidwellii (Ell.) Viala & Rav.

Ont.- A scattered infection of black rot was observed on the Roger variety in a vineyard in Welland county.

DOWNY MILDEW- Plasmopara viticola (Berk. & Curt.) Berl. & de Toni

Ont.- Downy mildew was prevalent on Agawan, a very susceptible variety, in Lincoln county. The disease is quite general in unsprayed vineyards.

Que.- Downy mildew moderately infected one variety among several at the Macdonald College. It was also noticed at St. Joseph du Lac, Chateauguay and Hemmingford; the leaves were moderately attacked, but the fruit was very seldom affected.

POWDERY MILDEW - Uncinula necator (Schw.) Burr.

Ont.- A scattered infection was reported on Concord in Wentworth county and on Agawan in Lincoln.

DEAD ARM - Fusicoccum viticolum Redd.

Ont.- Scattered, light infections of dead arm were found on Concord in a number of vineyards in Lincoln county. A moderate infection was found also on Concord at Springbank, Middlesex county.

LOGANBERRY

SPUR BLIGHT - Didymella applanata (Niessl.) Sacc.

B.C.- Spur blight was patchy in and caused slight damage to loganberry plantations at Gordon Head, Royal Oak and Saanichton.

SEPTORIA LEAF SPOT - Mycosphaerella Rubi Roark
(Septoria Rubi West)

B.C.- This leaf spot is general and heavily infects loganberry plantations on Vancouver island. No plantation has been found free of the disease and usually every leaf is infected (W. R. Foster).

ANTHER AND STIGMA BLIGHT - Haplospheeria deformans Syd.

B.C.- Three per cent of the anthers and stigmata were blighted in a patch of loganberry at Royal Oak. The fungus was identified by Dr. Dearness. As far as I know, this is the first report of this fungus on loganberry and also the first of its occurrence in North America. (W. R. Foster)

FRUIT BLIGHT - Cause undetermined

B.C.- Fruit blight caused from 5 to 70 per cent damage in plantations visited on Vancouver island.

PEACH

SCAB - Cladosporium carpophilum Thüm

Ont.- Scab was widespread in Grantham Tp., Lincoln county. In one orchard of Rochester, 50 to 75 per cent of the fruit was scabby.

Que.- Peach leaves affected with scab were sent to the Ottawa laboratory from Laval county.

LEAF CURL - Taphrina deformans (Berk.) Tul.

B.C.- Leaf curl was prevalent at the Experimental Station, Saanichton. According to the prevalence of the disease, the varieties were classified as follows: Rochester, Early Crawford and Hale's Early, very susceptible; White Alexander, Triumph and J.H. Hale, moderately susceptible and Stanwick, slightly susceptible. The disease was also widespread in the southern Okanagan valley, but it was not severe, only occasionally checking tree growth and attacking the fruit.

Ont.- Leaf curl was first found at Vineland Station on May 15. The disease was prevalent throughout Lincoln county, chiefly on trees, which had not been sprayed. Contrary to other years, fruit infection was much more common.

POWDERY MILDEW - Sphaerotheca pannosa (Wallr.) Lév. var. Persicae Woron.

B.C.- For the past two years powdery mildew has been quite serious on both foliage and fruit at Saanichton.

The disease was unusually severe this year at the Experimental Station, Summerland. The clingstone varieties were the most severely diseased, the young shoots and much of the fruit being affected. All the young nursery stock was also affected. In addition, powdery mildew was prevalent on many of the nectarines being grown at the Station. Some of the fruit and many of the terminal shoots were affected.

Ont.- Powdery mildew was prevalent on young peach nursery stock at Cedar Springs, causing stunting of growth.

BROWN ROT - Sclerotinia americana (Worm.) Nort. & Ezekiel

Ont.- At the experimental orchard at St. Catharines the check plots showed the following percentages of affected fruits: less than 5 per cent, Vidette, Valiant; 5-10 per cent, South Hanen, Crawford, J.H. Hale, St. Joyn, June Alberta; 10-20 per cent, Alberta, Rochester.

BLIGHT - Clasterosporium carpophilum (Lév.) Aderh. (= Coryneum Solierinckii Oud.)

B.C.- Blight was common on the Experimental Station plots at Saanichton and caused moderate damage; Rochester, Early Crawford, Alexander and Hale's Early were the most severely affected, while Stanwick, J.H. Hale and Triumph suffered slightly.

WILT - Verticillium sp.

Ont.- Wilt was found in seven different orchards in Lincoln

county. In one block of 2 to 3 year old trees, 25 per cent were affected; in another block of 40 trees interplanted with tomatoes 4 trees were affected on one side.

HEART ROT - Schizophyllum commune Fr.

Ont.- Heart rot caused by Schizophyllum commune, developed on a 5 year old Elberta tree following wounds in Lincoln county.

SPRAY INJURY - Non-parasitic

Ont.- Burning of foliage due to arsenical sprays caused the defoliation of 75 per cent of the leaves in a block of Rochester in Lincoln county.

PEAR

FIRE BLIGHT - Bacillus amylovorus (Burr.) Trev.

B.C.- Fire blight was severe and widespread at Westbank even where care was taken in the application of control measures; trees were lost in many blocks. At Penticton, it was not widespread early in the season, but few pear blocks were free of the disease at the end of the season. At Summerland, fire blight was widespread, but not severe, while at Olive it was found in several orchards.

Ont.- Twig blight was prevalent on 95 per cent of the trees in an orchard of Bartlett and Clapps Favourite in Lincoln county. Damage was severe as 50 per cent of the trees bore large limb cankers. Specimens affected with fire blight were received from Napanee and Willowdale.

Que.- In eastern Quebec fire blight was found only at St. Roch; 50 per cent of the trees were dying.

SCAB - Venturia pyrina Aderh.

Ont.- All the fruit was unmarketable on account of scab in an orchard of Flemish Beauty in Lincoln county; the foliage was also badly scabbed and much twig injury occurred.

Que.- Wherever scab susceptible pears were not sprayed in the Montreal district the fruit was heavily infected and the crop was unmarketable.

N.B.- Scab infections were light in sprayed orchards but some unsprayed trees were found, where the whole crop was scabby.

P.E.I.- Scab caused slight to severe damage on leaves and

fruit on Flemish Beauty in an orchard in Queens county. Some twig injury also occurred.

LEAF SPOT - Mycosphaerella sentina (Fr.) Schroet.
(Septoria piricola Desm.)

Ont.- The leaves were reported to be heavily infected with leaf spot, causing defoliation of the trees at Locust Hill. Specimens affected with leaf spot were also received from Campbellford.

P.E.I.- A moderate infection of leaf spot was reported.

DROUGHT SPOT - Non-parasitic

B.C.- Drought spot was on the increase in the southern Okanagan valley and was quite serious this year. It is usually confined to a few trees in any one orchard.

POWDERY MILDEW - Podosphaera leucotricha (Ell. & Ev.) Salm.

B.C.- Powdery mildew was fairly widespread in the southern Okanagan valley, but it was not serious this year.

PLUM

BLACK KNOT - Dibotryon morbosum (Schw.) Theiss. & Syd.

Ont.- Several trees were reported severely affected with black knot at Locust Hill.

Que.- In eastern Quebec from Montmagny to Rivière du Loup black knot severely affects all the trees in uncared-for orchards, the trees often being killed. In orchards where the trees are being heavily pruned, the disease is gradually disappearing. Wild plums in the Montreal district are also heavily infected.

PLUM POCKETS - Taphrina Pruni (Fuck.) Tul.

Alta.- Plums were lightly to moderately infected with plum pockets at Brooks.

BROWN ROT - Sclerotinia americana (Worm.) Nort. & Ezekiel

B.C.- A very heavy crop of plums on 2 Pound's Seedling trees showed much brown rot at Vancouver in August, although most of the fruit was still green. Fruit on other unidentified varieties were clean. Brown rot due to S. americana is always present on the lower mainland of British Columbia, but it was more severe than usual this year.

Que.- About 60 per cent of fruit on two trees at Chateauguay Basin were affected with brown rot. In eastern Quebec, brown rot was present in all orchards where no spraying was done; sometimes 100 per cent of the fruit being attacked. In sprayed orchards a trace to 25 per cent of the fruit rotted.

N.S.- Brown rot caused slight damage at Kentville.

SHOT HOLE - Higginsia prunophorae (Higg.) Nannf.
(Cylindrosporium prunophorae Higgins)

N.B.- Specimens heavily affected with shot hole were sent from Benoit to the Ottawa laboratory.

SCAB - Cladosporium carpophilum Thüm.

Specimens affected with scab were sent from Medicine Hat, Alta., St. Agapit, Que., and Benoit, N.B., to the Ottawa laboratory.

RUST - Tranzschelia Pruni-spinosae (Pers.) Diet.

B.C.- Plum rust was collected at Victoria; it was not destructive.

WILT - Verticillium sp.

Ont.- A trace of wilt was found in a plum orchard in Wentworth county.

GUM SPOT - Non-parasitic

B.C.- Gum spot appeared to have increased this year in the southern Okanagan valley. Victoria was especially susceptible.

RASPBERRY

SPUR BLIGHT - Didymella applanata (Niessl) Sacc.

Alta.- Spur blight caused 15 per cent damage in a plantation at Red Deer.

Ont.- Scattered infections of spur blight were observed in many plantations inspected in southern Ontario. In one planting in Wentworth county, Viking, Cuthbert and Newman were moderately infected.

Que.- Spur blight was prevalent in all the Herbert plantations throughout the province, from 40 to 60 per cent of the plants being moderately affected. In a few crowded plantings in eastern Quebec it was severe. Traces of the disease were found

in a few plantations of Newman and in one of Viking. In one plantation of Cuthbert, the plants were slightly affected and in one of Count, severely so.

SEPTORIA LEAF SPOT - Mycosphaerella Rubi Roark
(Septoria Rubi West.)

Ont.- Septoria leaf spot was common in many raspberry plantations in southern Ontario. It caused slight defoliation in one plantation of Viking in Norfolk county.

Que.- Septoria leaf spot was common on Herbert throughout Quebec, but no appreciable defoliation took place this year.

MOSAIC - Virus

B.C.- Mosaic was general in most plantations in the Fraser valley. Infections ranged up to 5 per cent. It was also reported from Salmon Arm and Sorrento.

Alta.- A light infection of mosaic was reported from Edmonton and Beaverlodge.

Ont.- Mosaic was widespread in southern Ontario. In some plantations as high as 85 per cent of the plants were affected. The disease was more prevalent in Cuthbert and Viking than in other varieties. In one plantation in Wentworth county near Hamilton, where 80 per cent of the plants were affected with mosaic, the disease seriously stunted the plants.

Que.- A slight amount of mosaic was present in the varieties grown at Macdonald College. Traces were found in almost all plantations of Newman; one showed 30 per cent and 2 contained 50 per cent of mosaic. It was also prevalent in Cuthbert, which is grown chiefly on the Isle of Orleans but one planting in Laprairie county had 50 per cent of the plants affected with mosaic. It was also observed in one plantation of Count and two of Herbert.

N.B.- Raspberries were slightly affected with mosaic in a plantation in York county. The disease is widespread on wild raspberries.

N.S.- One to two per cent of the raspberries were affected with mosaic in a plantation at Cambridge.

LEAF CURL - Virus

Ont.- Small amounts of leaf curl were found in widely scattered areas in southern Ontario, chiefly on the Cuthbert variety. In Ontario county, 2 per cent of the plants were

affected in a plantation of Viking, a variety rarely found diseased.

Que.- One per cent of plants were affected with leaf curl in a plantation of Cuthbert at Vaudreuil and a trace in another of the same variety on the Isle of Orleans.

ANTHRACNOSE - Elsinoe veneta (Burkh.) Jenkins
(Gloeosporium venetum Speg.)

Ont.- A plantation of Viking was moderately infected with anthracnose in Norfolk county.

Que.- Anthracnose was found in almost every plantation of Newman. Infection was as follows: trace in a few, moderate in most and severe in a few. Traces of anthracnose were found on Viking and Cuthbert and a slight infection on Brighton.

CANE BLIGHT - Leptosphaeria Coniothyrium (Fuck.) Sacc.
(Coniothyrium Fuckelii Sacc.)

B.C.- Cane blight was general on Vancouver island and the lower Fraser valley.

Ont.- A plantation of Cuthbert was heavily infected with cane blight in Welland county; 8 per cent of canes were killed.

BLUE STRIPE WILT - Verticillium sp.

Ont.- Blue stripe wilt was widespread and prevalent in many plantations in southern Ontario, up to 50 per cent of plants being affected and many being killed. It was found on both red and black raspberries.

YELLOW RUST - Phragmidium Rubi-idaei (DC.) Karst.

B.C.- Heavily rusted leaves were sent from a plantation of Cuthbert at Slocan City to the Summerland laboratory.

LATE YELLOW RUST - Pucciniastrum americanum (Farl.) Arth.

Ont.- Late yellow rust was general on the leaves in a plantation of Viking in Durham county. It was also found to a limited extent attacking the fruits.

Que.- This rust was found on Herbert, Cuthbert and Viking in a plantation at Cookshire. It was heaviest on Viking, the fruits of which were also rusted.

N.S.- Two to 30 per cent of the fruits were rusted in the Experimental Station plots, Kentville.

POWDERY MILDEW - Sphaerotheca Humuli (DC.) Burr.

Ont.- Powdery mildew generally infected a plantation of Latham in Lincoln county, causing some stunting of growth. This variety appears to be highly susceptible to powdery mildew, but Count and Brighton were also affected.

CROWN GALL - Pseudomonas tumefaciens (Sm. & Towns.) Duggar

Ont.- Crown gall is widespread on raspberries in southern Ontario, but it apparently causes little damage. Ten per cent of the plants were affected in a plantation of Cuthbert in Elgin county. It was also noted on Viking, Latham, Brighton and Count varieties.

N.B.- One specimen affected with crown gall was received from Sussex.

WINTER INJURY - Non-parasitic

Ont.- In a plantation in Lincoln county, 60 per cent of the Viking plants were injured. In the same plantation, Brighton showed no injury, while 30 to 80 per cent of the Cuthbert plants were affected. The addition of nitrate to the plantation in the spring of 1931 resulted in much succulent growth. It is thought that this condition and the presence of mosaic were predisposing factors.

Que.- At Macdonald College from 25 to 35 per cent of the canes suffered from winter injury in a plot of Viking and about 8 per cent were killed to the ground.

STRAWBERRY

LEAF SPOT - Mycosphaerella Fragariae (Schw.) Lindau
(Ramularia Tulasneii Sacc.)

Que.- Leaf spot was first observed at Macdonald College on June 2. Infection was slight to moderate; damage was very slight. In western Quebec the disease was observed in many patches, but the damage was slight.

N.B.- Leaf spot was common in York county, but the damage was slight.

N.S.- Leaf spot infected 75 per cent of the leaves in a field of Senator Dunlop at Masstown, an important strawberry district in recent years, the the owner estimated that the yield was reduced 25 per cent. A portion of the field sprayed with Bordeaux was much cleaner and according to the owner it had yielded more and higher quality fruit. Other fields examined in the district were

similarly affected. At Kentville, leaf spot and drought reduced the strawberry crop by 50 per cent in several plantings.

LEAF SCORCH - Diplocarpon Earliana (Ell. & Ev.) Wolf
(Larssonina Fragariae (Sacc.) Kleb.)

Ont.- Leaf scorch was exceptionally prevalent in Brant, Norfolk, Middlesex and Elgin counties and caused some reduction of crop.

ROOT ROT - Cause undetermined

B.C.- Root rot caused severe damage on a farm in the Gordon Head district. Five species of saprophytic nematodes were found and several fungi were isolated from the diseased tissue, but inoculation experiments with these fungi gave negative results. (R.J. Hastings)

Ont.- Root rot affected 30 per cent of the plants in a planting of Premier in Lincoln county.

N.B.- Root rot was widespread and the damage was severe.

TRANSPORTATION DISEASES

As stated previously these observations were made by Mr. H.A. Cannadine at Saskatoon.

ORANGE - Blue and Green Moulds (Penicillium spp.). Oranges received during the past season have shown some decay due to the common blue and green moulds; some cars have shown considerable shrinkage while others contained high quality fruit and were received at destination in first class condition. The amount of decay is apparently governed, to a large extent, by the condition, age and maturity of the fruit at the time of shipping.

Oranges received during March and April showed considerable spotting at the stem end of the fruit. Samples were sent to Dr. H. S. Fawcett of the University of California, who replied as follows:

"A considerable amount of this spotting at stem end has occurred this year and was probably accentuated by the very wet weather which we had in most of the districts of Southern California during January and part of February. In some cases spots appear to follow very small cracks or rifts in the cuticle of the rind which appear to be most common near the stem end of the fruit. In other cases they may follow slight injuries to the rind at the stem end, due to a little stub or branch standing out close to the fruit. In some cases there

was also hail injury. Into these various injuries a secondary fungus enters, such as Cladosporium, Alternaria, or Colletotrichum and the discolouration results. If the conditions are dry with a small amount of humidity, many of these spots dry and no decay from blue or green mould follows. If, however, the weather is damp and the humidity high, the number of the spots are followed by the appearance of the blue and green mould."

LEMON - The only decay noticed was that caused by the common blue and green moulds (Penicillium spp.).

GRAPEFRUIT - Blue mould (Penicillium sp.) was noted on grapefruit. A stem end rot caused apparently by a fungus was observed on grapefruit.

STRAWBERRY - Black Mould (Rhizopus). Some loss of strawberries resulted from the fruit being over-ripe on arrival or infected with black mould.

APPLE - Apples were chiefly affected with storage troubles such as scald, "soggy breakdown", "internal breakdown" and "internal browning". Badly affected fruits were sometimes rotting with blue mould (Penicillium sp.). Some water core and core rot also occurred.

PEACH and PLUM - Shrinkage in peaches and plums was chiefly due to the fruit being over-ripe, soft and leaky followed by black mould (Rhizopus). For some unknown reason peaches, plums and pears were exceptionally free of brown rot (Sclerotinia americana) this season.

No diseases were noted in pineapples, bananas, prunes, berries and grapes.

V. DISEASES OF FOREST AND SHADE TREES

ASH (Fraxinus)

RUST - Puccinia sparganioides Ell. & Barth.

A small tree of white ash growing near a marsh was killed by rust in Kings county, N.S.

A leaf spot (Phyllosticta viridis Ell. & Kell.) caused slight to moderate damage to the leaves of ash at Lumsden, Sask. Pigotia Fraxini Berk. & Curt. was also present on the leaves.

BALSAM FIR (Abies balsamea)

WITCHES' BROOM - Melampsora Caryophyllacearum Schroet.

N.B.- Witches' broom was common in York county.

N.S.- Two per cent of the balsam in a pasture were affected with witches' broom in Annapolis county.

P.E.I.- The disease was noticed first at Brackley Point. A survey made later in the year indicated that it was common in Prince Edward Island wherever balsam was growing.

BASSWOOD (Tilia)

A leaf spot (Cercospora microsora Sacc.) slightly to moderately infected basswood in Queens county. P.E.I.

BEECH (Fagus)

Ehrlich (Phytopath. 23:10, 1933) reports the occurrence of a destructive disease of beech in stands of this tree in the Maritime provinces of Canada. A survey of the afflicted regions disclosed that 90 per cent of the trees over 3 inches in diam, at breast height in forest stands are infected and 50 per cent of the trees that had been diseased for several years were dead. The disease is caused by Creonectria coccinea (Pers.) Seaver. following attacks by the beech scale, Cryptococcus fagi.

CHESTNUT (Castanea)

BLIGHT - Endothia parasitica (Murr.) Anders. & Anders.

Ont.- Trees dying from blight were found in Norfolk county.

ELM (Ulmus)

BLACK SPOT - Gnomonia ulmea (Schw.) Thüm.

Black spot was observed on elms in 9 countries about Montreal. It was estimated that 95 per cent of the trees showed the disease, and on some trees nearby, 100 per cent of the leaves on the lower branches were affected.

FIRETHORN (Pyracantha)

SCAB - Fusicladium Pyracanthae (Othth.) Fuckel

A low percentage of firethorn were infected with scab in the Fraser valley; some bushes were severely infected.

HAWTHORN (Crataegus)

FIRE BLIGHT - Bacillus amylovorus (Burr.) Trev.

B.C.- A specimen of English hawthorn affected with fire blight was sent from Whonnock to the Ottawa laboratory by Dr. Wm. Newton.

P.E.I.- Some fire blight was present on C. Oxyacantha at Charlottetown, although the bushes had been carefully pruned to remove diseased wood in 1931.

HORSECHESNUT (Aesculus)

LEAF BLIGHT - Guignardia Aesculi (Pk.) Stewart
(Phyllosticta Paviae Desm.)

Leaf blight was prevalent along the highways in Halton county, Ont. Diseased specimens were also received from Hemmingford, Que., and it was reported to have caused moderate to severe damage in all 3 counties in Prince Edward Island.

MAPLE (Acer)

A heavy infection of tar spot (Rhytisma acerinum (Pers.) Fr.) was found at Drumheller, Alta. Tar spot was also reported on silver maple (A. saccharinum) as follows: 2 or 3 localities in western Quebec; trace in York county, N.B.; trace at Highbury, N.S.; 25 per cent of the leaves affected on several trees at Charlottetown, P.E.I.

Sugar maple (A. saccharum) was slightly infected with leaf spot (Phyllosticta minima (Berk. & Curt.) Ell. & Ev.) at Macdonald College, Que. It occurred principally on the leaves of young

trees, which were shaded by older and larger ones.

Blight due to Cytospora chrysosperma (Pers.) Fr., was found affecting 7 young maples, two of which were killed in Kamouraska county, Que.

MOUNTAIN ASH (Sorbus)

A leaf spot apparently caused by bacteria was common on mountain ash at the Experimental Farm, Indian Head, Sask.

Five mountain ash trees about 25 years old were killed by fire blight in a grove at Macdonald College. Several other trees were severely affected. Mountain ash and rowan trees were slightly to severely affected by fire blight at Charlottetown, Summerside and Souris, P.E.I. Many of these ornamentals are dying or are so severely diseased that they are being removed.

One canker caused by Nectria cinnabarina (Tode) Fr., was found on mountain ash at Kentville.

OAK (Quercus)

Leaf curl (Taphrina caerulescens (Desm. & Mont.) Tul.) heavily infected all the leaves on about 200 trees at Beaverlodge, Alta.

PINE (Pinus)

WHITE PINE BLISTER RUST - Cronartium ribicola Fischer

Ont.- Scattered infections of rust were shedding aecios pores in an old stand of white pine in Lincoln county, on May 18. Twenty to 30 per cent of the young trees were found diseased in a stand, where there was considerable reproduction, near Morton. Aeciospores were still being shed on June 6. Some trees had been killed and others bore cankers on the trunk. Ribes were already showing well developed uredinia.

Que.- Blister rust was found on young trees on the Mountain road near Wrightville. The blisters were showing, but had not yet opened (I.L. Conners).

In addition to the outbreaks of blister rust reported from Chateauguay and Oka last year, it was observed on about 10 trees 6 to 8 inches in diam. growing in a pasture near Hemmingford.

N.B.- Blister rust appears to be spreading in the province although it causes slight damage.

N.S.- Open aecia of blister rust were abundant on limbs of large trees at the Experimental Station, Kentville, on May 12.

P.E.I.- Blister rust has definitely increased in prevalence in the past 3 years in Queens county. It has heavily infected trees in woods and frequently may be found on ornamental plantings; the damage is severe.

POPLAR (Populus)

CANKER - Cytospora chrysosperma (Pers.) Fr.

Que.- Ten per cent of the 4 year old Carolina poplar trees were infected with canker in a block in Kamouraska county; badly diseased trees were killed.

LEAF BLIGHT - Sclerotium bifrons Ell. & Ev.

Ont.- Leaves of P. deltoides affected with leaf blight were sent in from Orillia to the Ottawa laboratory.

POWDERY MILDEW - Uncinula Salicis (DC.) Wint.

Que.- Leaves of young poplars only were heavily infected with powdery mildew near Hemmingford.

CANKER - Hypoxylon pruinaum (Klotzsch) Oke.

Man.- This canker causes the death of many trees of P. tremuloides in poplar bluffs.

SPRUCE (Picea)

NEEDLE RUST - Peridermium sp.

Sask.- Needle rust caused by Chrysomyxa sp. was common and serious on spruce between Prince Albert and the Prince Albert National Park. Heavy infection has resulted in the death of the majority of the needles on young twigs (W.P. Fraser, R.C. Russell and W.L. Kerr).

P.E.I.- Needle rust was widespread and moderately to heavily infected the leaves of native spruce, being especially severe in Prince county. A light infection was also observed on Picea pungens at the Experimental Station, Charlottetown.

CANKER - Cytospora sp.

A canker caused by Cytospora has been found in 3 localities in the Niagara peninsula: Vineland, Beamsville and Winona, Ont.

The disease first appears in the branches and extends from there down into the trunk causing cankers. The cortical region is involved primarily and if superficial cuts are made into dead or dying branches, black stromatic masses are laid bare. The disease is most easily recognized after rains in the spring, when striking orange tendrils of spores exude abundantly. Inoculation studies have been undertaken. This is apparently the first report of this disease for Canada (D. L. Bailey)

A similar, if not the same disease, is reported by Gilcut and Boyd, (Phytopath. 23:11. 1933).

TULIP TREE (Liriodendron)

TAR SPOT - Rhytisma Liriodendri Wallr.

Que.- The leaves were moderately infected with tar spot at Macdonald College.

WILLOW (Salix)

Tar spot (Rhytisma salicinum (Pers.) Fr.) moderately infected narrow leaved willows at several places in western Quebec.

Powdery mildew (Uncinula salicis (DC.) Wint.) was reported from Summerland, B.C. It was common in Quebec. Narrow-leaved willows in a swamp near Hemmingford were moderately infected. In Queens county, P.E.I., swamp willows were slightly to heavily infected.

SCAB - Fusicladium saliciperduum (All. & Tub.) Tub.

Que.- Fifty per cent of the trees between Levis and Rimouski are affected with scab. Where the disease is well established the trees were completely killed. A moderate infection of scab was also observed at Bowker Lake, Lennoxville, Waterville and Compton.

N.B.- Scab was widespread; the damage was severe.

N.S.- At Grand Pré, 10 per cent of the twigs were diseased on Salix vitellina.

P.E.I.- Scab caused slight damage in all 3 counties in 1932, but it was very injurious in 1931.

BLACK CANCER - Physalospora Miyabeana Fukushi

N.S.- It was estimated that black canker caused 2 to 3 per cent damage on Salix vitellina at Grand Pré. This disease was not so noticeable this year.

VI. DISEASES OF ORNAMENTAL PLANTS

AZALEA

Three hundred plants were unmarketable on account of red leaf (Exobasidium Vaccinii (Fuck.) Woron.) in a greenhouse at Etobicoke, Ont. Only a few malformed blooms were formed.

BAISAM (Impatiens Balsamina)

Wilt infected 30 per cent of the plants in a planting in Lincoln county, Ont. The plants were grown on ground previously cropped with tomatoes. Verticillium sp. was isolated from diseased plants.

CALLA (Zantedeschia)

Bulbs of Calla imported from New York State were planted in pots at Kingston, Ont. Some of the bulbs grew and produced healthy plants; others rotted with bacterial soft rot (Bacillus carotovorus L.R. Jones). It appears that the bulbs were diseased when imported.

CAMELLIA

Leptosphaeria Camelliae Cke. & Massee caused small lesions on the twigs of camellia at North Saanichton. (J.E. Bosher)

CAMPANULA

Five per cent of the flower stalks were killed at the base by wilt (Sclerotinia Sclerotiorum (Lib.) de Bary) in a garden at Saanichton, B.C.

CARAGANA

Leaf spot (Septoria Caraganea (Jacz.) Died.) lightly to heavily infected the leaves on many hedges at Edmonton, Alta. It caused some leaf drop.

As early as July 18, pycnidia were extruding mature spores on a fairly heavily infected hedge at Saskatoon, Sask. Later in the season severe premature defoliation was widespread, which was quite as heavy as in 1928. From one hedge 75 per cent of the leaves had fallen by Sept. 5.

CANNATION (Dianthus)

Rust was widespread on carnation in New Brunswick, but the damage was slight. It was also observed on a few plants in Kings county, N.S.

CHINA ASTER (Callistephus)

Wilt (Fusarium conglutinans Woll. var. Callistephi Beach) was

prevalent at many places on Vancouver island; the plants died before or during blooming.

Wilt caused medium damage at Edmonton, Alta.

This disease was severe in one garden at Melville, Sask.

A light infection of wilt was found in a garden in Lincoln county, Ont. Two-thirds of the plants were affected with wilt in a garden near Ottawa. The disease was also reported from Mattawa.

Wilt infected 5 and 8 per cent of the plants respectively in 2 gardens at Ste. Anne de la Pocatière, Que.

Yellows (Virus) affected 4 to 5 per cent of the plants on one seed farm at Westholme, B.C.

Yellows was widespread and severe at Saskatoon, Sask. It was observed in practically every planting of asters and severely damaged many beds.

This disease was worse than usual in Manitoba. It has practically ruined aster culture.

Yellows was widespread and destructive in New Brunswick. At the Experimental Station, Fredericton, infection ranged from 85 to 100 per cent on the 14 aster varieties (600 plants) grown. Several perennials were also grown in test plots to determine their susceptibility to yellows. The results reported by Mr. D.J. MacLeod are as follows: Coreopsis, Scabiosa, Everlasting (Helichrysum), Sweet Sultan (Centaurea moschata) and Marigold (Tagetes), 100 per cent of the plants infected and common in York county; Calendula, 100 per cent, disease widespread and destructive; Chrysanthemum and Thrift (Statice) 100 per cent; Bartonina (Mentzelia aurea), 5 per cent, severe; Gaillardia, 5 per cent; Butterfly flower (Schizanthus) and Zinnia, 2 per cent. In addition, 90 per cent of the plants of Sonchus arvensis were affected in the test plot and the disease was widespread and destructive on this host and Leontodon autumnalis.

Yellows is very common on cultivated asters in Prince Edward Island and it is so destructive that it is now considered useless to attempt their culture. This disease was also observed on several other ornamentals as follows: Calendula, one per cent of the plants were affected in a garden at Charlottetown, the diseased plants being severely damaged; Dahlia, destructive on Jane Cowl, Jersey Beauty and Ambassador varieties; Larkspur (Delphinium), one plant yellowed at the Experimental Station; Marigold (Tagetes) 2 and 25 per cent of the plants affected at the Station and in a city garden respectively; Zinnia, 15 per cent of the plants affected in a city garden, Charlottetown.

CHRYSANTHEMUM

Powdery mildew (Oidium Chrysanthemi Rabh.) was common on plants at the Experimental Station, Fredericton, N.B.

CLEMATIS

Yellows (?Virus). Some ornamental Clematis plants at the

Agricultural College, Winnipeg, developed spindly yellow leaves and branches.

Septoria leaf spot (S. Clematidis Rabh.) was severe on the lower leaves of Clematis vines at the Experimental Farm, Indian Head, Sask.

DAHLIA

Crown gall (Pseudomonas tumefaciens (Sm. & Towns.) Duggar) was observed on dahlia plants sent from Scotland, Ont., to the Ottawa laboratory.

A tuber rot of bacterial origin was widespread on several varieties of dahlia in New Brunswick; the damage was severe.

GERANIUM (Pelargonium)

Grey mould (Botrytis cinerea Pers.) was destructive in a greenhouse at Charlottetown. Occasional outbreaks of this disease occur in local greenhouses (R. R. Hurst).

GLADIOLUS

Infection by hard rot (Septoria Gladioli Pass.) was general but light on Vancouver island and in the lower Fraser valley, B.C.

Hard rot caused a trace to moderate infection in Queens county, P.E.I.; the damage was slight to moderate. This is the first report of hard rot from this province.

Specimens affected with dry rot (Sclerotium Gladioli Massey) were received from Saanichton, B.C.

Scab (Bacterium marginatum McCull.) infection was slight, but affected plants died at Saanichton, B.C.

Scab was found at Vermilion, Alta.

Two specimens affected with scab were found at Fredericton, N.B.

Scab was common and destructive in 1930 in Queens county, P.E.I. The damage was slight to severe.

HOLLY (Ilex)

An unknown trouble, which causes the normal red berries to turn black, has been found at 3 different places in the Victoria district, B.C. (W.R. Foster)

HOLLYHOCK (Althaea)

Rust was general and caused severe damage at Saanichton, B.C. It was also reported from Summerland and Penticton.

Rust blighted the blossoms of hollyhock in a garden in Victoria county and severely defoliated the plants in a garden at Gananoque. It was also very general in Lincoln county.

Hollyhock rust was general in the Montreal district, Que. Damage is generally slight as the plants do not become rusted until the end of the summer. It was also reported from Macdonald College and Lennoxville, Que.

About 2 dozen plants were found heavily infected in a garden in Annapolis county, N.S.

Hollyhock rust slightly to severely damaged the plants in Queens county. Lime sulphur and sulphur used to control the rust were injurious to the plants.

HONEYSUCKLE (Lonicera)

Powdery mildew (Microsphaera Alni (Wallr.) Salm. var Lonicera (Schlecht.) Salm.) slightly infected L. tatarica on Sept. 25 in Queens county, P.E.I.

IRIS

Leaf spot (Didymellina macrospora Kleb. (Heterosporium gracile Sacc.) was reported as follows: Saanichton, B.C., general, causing severe damage; University gardens, Saskatoon, Sask., severe late in the season; Winnipeg, Man., prevalent as usual on iris; Lincoln county, Ont., moderate infection on iris; Macdonald College, Que., slight infection, first observed on June 16; Queens county, P.E.I. every garden slightly to heavily infected, some damage usually after the blooms have faded.

Rhizome rot (Bacillus carotovorus L. R. Jones), along with damage caused by an "iris root borer" caused moderate damage in the horticultural plots, Rosthern, Sask. Rhizome rot caused considerable damage at the Manitoba Agricultural College in 1932. It also caused slight damage in Lincoln county and at Brampton, Ont., and in gardens at Charlottetown, P.E.I.

Leaf spot (Phyllosticta Iridis Cke.) was reported from Saanichton, B.C.

Bulb nematode (Tylenchus dipsaci Kuhn) was found in several rotted bulbs at Saanichton, B.C. (See Phytopath, 23:103-106. 1933)

Mosaic (virus) was found on iris in a garden and greenhouse at Edmonton, Alta.

Storage rot (Penicillium sp.) was noticed at Saanichton, B.C. in shipments of bulbs from Washington state. Six per cent of the bulbs were destroyed.

LADYSLIPPER (Cypripedium)

Streak (Virus). Ladyslippers in the gardens of J.C. Bennett, a specialist in the production of rare plants, were found to be affected with what appears to be an infectious virus disease. The leaves of infected plants first show pale green streaks and are somewhat stiff and harsh in texture, later reddish brown streaks appear. Only yellow flowering species were found diseased (Wm. Newton).

LARKSPUR (Delphinium)

Powdery mildew (Erysiphe Polygoni DC.) was general and caused severe damage to white varieties, resulting in defoliation of some plants, at Saanichton, B.C. Some blue varieties were definitely resistant. This disease was also reported from Penticton.

Ninety per cent of the plants were affected with powdery mildew at the Experimental Station, Fredericton, N.B.

Bacterial blight (Pseudomonas Delphinii (E.F. Sm.) Stapp, caused severe damage to 90 per cent of the plants at the Experimental Station, Fredericton, B.C. This disease was found in several gardens at Kentville, N.S. It is apparently on the increase. Bacterial blight caused severe damage at the Experimental Farm, and slight to severe damage in city gardens, Charlottetown, P.E.I.

LILAC (Syringa)

Powdery mildew (Microsphaera Alni (Wallr.) Salm.) moderately infected the lilacs at MacDonald College, Que. It was general in the Montreal district. Traces of mildew were also found in the 3 counties of Prince Edward Island.

LILY (Lilium)

Mosaic (Virus) was reported on L. auratum at Saanichton, B.C. The leaves showed brown streaks and were much twisted,

Blight (Botrytis elliptica (Berk.) Oke.) was less prevalent than last year at Saanichton, B.C. The following species were attacked: severely, L. Chalcedonicum and L. Hansonii; slightly, L. martagon, L. Baryi, L. canadense rubrum and L. Grayi.

LOBELIA

The root knot nematode (Caenema radiculicola) was found infecting lobelia, which was growing along with the common geranium (Pelargonium hortorum, the ivy-leaf geranium (P. peltatum), marguerites (Chrysanthemum frutescens) and Nepeta glechoma in window boxes at Saanichton, B.C. The characteristic knots or

galls were abundant on the roots of the lobelia, but no root knots or other symptoms were found on the other plant species in spite of their intimate association. Evidently the nematode species was not a specialized form for inoculum from the lobelia roots transferred to healthy tomato seedlings resulted in the development of the characteristic symptoms of root knot on the tomatoes. (J. E. Bosher & Wm. Newton)

LUPINE (Lupinus)

Powdery mildew (Erysiphe Polygoni DC.) was reported on lupine from Summerland, B.C.

NARCISSUS

Blight (Ramularia Vallisumbrosae Cav.) was very destructive about Cowichan Station, B.C. The leaves were killed from the tips to the ground. The disease was observed at Saanichton in a number of private gardens where the bulbs had not been dug and plants were growing in large clumps. It was very rare in commercial plantings. It was also reported from Abbotsford, B.C. This is the first report of this disease in Canada.

Leaf scorch (Stagonospora Curtisii (Berk.) Sacc. (= S. Narcissi Hellés) was very general in the Saanichton district, B.C., but it caused no significant damage. It was also found at Whonnock, B.C.

Smoulder (Botrytis narcissicola Kleb.). Infection from smoulder was general, but little damage occurred except in weedy patches or among closely planted bulbs at Saanichton, B.C.

Root decline (Tylenchus pratensis) was observed in two plantings in the Gordon Head district, B.C. The nematode is considered to be the cause of the root rot, but associated with it is a Cylindrocarpum sp., which is reported as the cause of root decline in Europe. This is the first record of Tylenchus pratensis on narcissus roots (see U.S. Plant Disease Reporter, vol. 16, No. 11, Aug. 1, 1932)

Ring disease (Tylenchus dipsaci (Kühn) Bast.) was found in 6 out of 11 plantations examined in the Saanichton district. The losses are heavy. The following varieties were attacked: Spring Glory, L. Roster, Henry Irving, Elvira, King Alfred, Emperor, Golden Spur, Glory of Sassenheim, Madame de Graaf, Victoria, Sir Watkin, Ornatus and Mrs. Langtry.

NASTURTIUM (Tropaeolum)

Blight (Pseudomonas aptata (Br. & Jamies.) Stapp, moderately

infected nasturtium at Lethbridge, Alta., causing browning and death of the plants.

PANSY (Viola)

Rust (Puccinia Violae (Schum.) DC.) was recorded on pansy from Victoria, B.C.

PEONY (Paeonia)

Blight (Botrytis Paeoniae Oud.) was recorded on peony at Saanichton, B.C. as follows: severely infected, Jeanne Gaudechau, Marie Jacquin and Galatea; moderately, Splendida; slightly, Adolphe Rousseau, L'Etincelante, Sarah Bernhardt, Lamartine and Venus. It was probable that the heavy dressing of leaf mould on the beds and wet weather favoured the disease. (R. J. Hastings)

Blight occurred in almost epidemic form on peonies at Winnipeg, Man., causing much rotting of the lower stems.

Although blight was severe in 1931, only a small amount was present this year at Macdonald College, Que. Rotation and burning of the dead tops last year was apparently beneficial. Diseased specimens were also received at the Ottawa laboratory from Chateauguay, Que.

The disease was widespread, but the damage was slight in New Brunswick, while it caused moderate damage in all 3 counties in Prince Edward Island.

Ring spot (?Virus). A very few plants were seen in 1931 with the striking leaf markings of ring spot at Man. Agricultural College. In 1932 the disease appeared on many adjacent plants.

PETUNIA

Stem rot (Sclerotinia Sclerotiorum (Lib.) de Bary) was destructive in several flower beds in Jacques Cartier county; wherever the disease was observed the damage was severe.

Late blight (Phytophthora infestans (Mont.) de Bary) was present in a number of gardens in Charlottetown. In one, 22 per cent of the plants were infected and moderately damaged. This is the first time it has been observed on petunia in Prince Edward Island (R. R. Hurst).

PHLOX

Leaf spot (Cercospora omphakodes Ell. & Holw.) was destructive to P. divaricata in a garden in Ottawa. Dr. Charles Chupp kindly verified the determination of the causal organism (I. L. Connors).

Powdery mildew (Erysiphe Cichoracearum DC.) was very prevalent in several gardens in Lincoln county, Ont., stunting and weakening the plants. It was also destructive in one garden in Ottawa.

Traces of powdery mildew were reported in a garden in Queens county, P.E.I.

RHODODENDRON

Leaf spot (Pestalotzia Rhodendri (D. Sacc.) Guba) caused a trace of damage on rhododendron at Sardis, B.C.

ROSE (Rosa)

Black spot (Diplocarpon Rosae Wolf. (Marssonina Rosae (Lib.) Died.). Infection was general on Vancouver island and in the lower Fraser valley. The fungus was already fruiting on leaves collected April 28 at Saanichton.

Black spot heavily infected certain yellow flowered varieties in the University garden, Saskatoon, Sask. It was especially heavy on Persian Yellow and Austrian Yellow.

This disease was prevalent, causing partial defoliation on Daily Mail, Frau Karl Druschki, Pernet, Talisman and Shot Silk in a garden in Lincoln county, Ont.

Black spot is often observed on roses in the Montreal district, Que.

Black spot was widespread in New Brunswick; the damage was slight.

This spot moderately infected Frau Karl Drushki and Persian Yellow and slightly infected Lady Astor, Alfred Colomb and A. E. Williams at the Experimental Station, Charlottetown, P.E.I.

Powdery mildew (Sphaerotheca pannosa (Wallr.) Lév.) was general on Talisman, Pernet and Mrs. Van Rossem, in a garden in Lincoln county, Ont.

It caused slight damage at Macdonald College, Que., and in New Brunswick.

Powdery mildew caused severe damage, chiefly on climbing roses, in the 3 counties of Prince Edward Island. Dusting the plants was useless in controlling the disease.

Rust (Phragmidium spp.) was reported on Pauls Scarlet Climber at Saanichton, B.C. It was also reported from Melowna.

Rose rust was widespread in New Brunswick, but the damage was slight.

The aecial stage of Phragmidium americanum caused up to 5 per

cent damage in a garden at Kentville.

Rust infections varied widely on cultivated roses at Charlottetown, P.E.I. It was heavy on Duke of Edinburgh, Star of Waltham, Margaret Dickson, and Louise Cretté. Moderate on Lady Astor, General Jacqueminot, Frau Karl Druschki and A. E. Williams; and light on Edith Cavell, Crimson Rambler and Captain Hayward. It caused some damage where the leaves were heavily infected. Rust was also abundant on wild roses.

ROSE OF SHARON (Hibiscus)

A leaf spot severely affected the bushes in a garden in St. Catharines. The leaves were spotted and turned yellow. Alternaria sp. was isolated from the diseased spots.

SNAPDRAGON (Antirrhinum)

Rust (Puccinia Antirrhini Diet. & Holw.) infection was general at Saanichton, B.C. in Sept. 1932.

Snapdragons were moderately rusted at Saskatoon, Sask., late in the season. Rusted specimens were also received from Regina,

Rust was severe on snapdragons at Souris, Manitoba.

Rust was prevalent on snapdragons in August in Lincoln county. Rusted plants were also sent to the Ottawa laboratory from East Windsor.

Rust was present in a greenhouse at Macdonald College, Que. It spread to gardens in the vicinity by the sale of diseased young plants. The period of profitable bloom was reduced about 35 per cent.

Verticillium wilt (Verticillium sp.) appeared on young plants in a greenhouse in Lincoln county, Ont. on Jan. 11, shortly after they had been transplanted.

A root rot (Fusarium sp.) caused some damage in Winnipeg, Man.

One large bed of snapdragons in a greenhouse on the Island of Montreal was a total loss on account of root knot (Caconema radicola (Greef) Cobb).

SNOWBERRY (Symphoricarpos)

Traces of powdery mildew (Microsphaera diffusa Cke. & Pk.) was observed in Queens county, P.E.I.

STOCK (Matthiola)

Stocks affected with root rot (Rhizoctonia sp.) was sent to the University, Saskatoon from a garden at Canora, Sask. The stocks had been grown in the same location for several years.

SWEET PEA (Lathyrus)

Powdery mildew (Microsphaera diffusa Cke. & Pk.) was found in a garden at the Experimental Farm, Fredericton, N.B.

Sweet pea was slightly affected with powdery mildew in a garden in Queens county, P.E.I.

Leaf spot (Ascochyta Lathyr Trail) caused slight damage at Saanichton, B.C.

White mould (Eurostotheca multiformis Martin & Charles (Cladosporium album Dows.) severely infected sweet peas here and there at North Cowichan, B.C. and caused considerable damage. White mould was heavy, but the damage was slight at Westholme.

A heavy infection of streak (Sacillus Lathyr Manns. & Taub.) was present in a garden in Edmonton, Alta. It was also observed in several other gardens.

Black root rot (Thielavia basicola Zopf) caused moderate to severe damage to sweet peas in a city garden, Saskatoon, Sask. The root system was extensive, but blackened. The dark brown chlamydospores were present in abundance. The trouble developed some time after an excessively heavy application of superphosphate.

A stem and root rot due to Rhizoctonia sp. caused moderate damage to sweet peas in the University garden, Saskatoon, Sask. A trace of Thielavia basicola was also present.

A root rot due to Fusarium sp. caused moderate damage in many gardens in Saskatoon, Sask. The flowers dropped off before being fully formed and the diseased plants were slightly shorter than healthy ones. Climatic conditions appeared to be unfavourable for sweet peas in 1932 and the weakened plants were attacked by Fusarium or Rhizoctonia.

Milt caused by Fusarium Solani (Mart) App. & Wol. var. Martii (App. & Wol.) Wol. and possibly other species of Fusarium caused severe damage to sweet peas at Morden and Winnipeg, Man. and Keewatin, Ont. (W.L. Gordon)

Bud drop (cause undetermined) was common at Fredericton, N.B.; the damage was moderate.

TULIP (Tulipa)

Blight (Botrytis Tulipae (Lib.) Lind) was very general at Saanichton, B.C. and caused severe damage. The sclerotia on dead flower stalks germinated and produced spores by Feb. 10. Soil infected shoots were noticed on March 1. (R.J. Hastings)

Blight caused severe damage to late varieties in a garden in Lincoln county, Ont.

Blight caused slight to severe damage in gardens and at the Experimental Farm, Charlottetown, P.E.I. From a few to 50 per cent of the plants were affected.

Storage rots mainly due to Penicillium spp. caused heavy losses again this year at Saanichton, B.C.

ZINNIA

Wilt (cause undetermined) caused the death of about 35 per cent of the plants in a breeding block at the Experimental Station Summerland.

Stem rot (Sclerotinia Sclerotiorum (Lib.) de Bary) was reported on zinnia in Manitoba.

In one large bed of zinnias all the plants were killed by stem rot at Macdonald College, Que.

VII. DISEASES OF MISCELLANEOUS PLANTS

Most of the records reported in this section were contributed by Messrs. R. C. Russell and René Pomerleau, who are located at Saskatoon, Saskatchewan and Berthier, Quebec, respectively. It was impossible to add many reports from specimens collected at Ottawa during the past season, as most of this material is awaiting determination. It would have been preferable to have placed certain items in the preceeding sections, but it was noticed that they were out of place after the manuscript of those sections were complete. When the year is not mentioned it is to be understood that the collection was made in 1932.

Abies balsamea (L.) Mill

Melampsorella Caryophyllacearum Schroet. July 1, Lanoraie, Que.

Peridermium balsameum Pk. July 17, Quebec.

Acer pennsylvanicum L.

Rhytisma punctatum (Pers.) Fr. Lavaltrie, Que.

Acer saccharinum L.

Uncinula circinata Cke. & Pk. Sept. 28, 1930, Que.

Rhytisma acerinum Sept. 19, 1930, Berthier, Que.

Phylllosticta acericola Cke. & Ell. July 21, Berthier, Que.

Acer saccharum Marsh

Rhytisma acerinum Sept. 2, 1930, Berthier, Que.

Acer spicatum Lam.

Rhytisma punctatum (Pers.) Fr. Sept. 16, 1930, St. Gabriel, Que.

Actaea rubra (Ait.) Willd.

Puccinia Clematidis (DC.) Lagerh, June 18, Berthier, Que.

Aesculus Hippocastanum L.

Phyllosticta Paviae Desm. Sept. 2, 1930, Berthier, Que.

Agropyron repens (L.) Beauv.

Claviceps purpurea (Fr.) Tul. Four per cent of the heads infected Aug. 15, on one farm in Temiscouata county, Que. Very slight infection, Sept. 14, Experimental Station, Charlottetown, P.E.I.

Erysiphe graminis DC. Moderate infection July 18, Macdonald College, Que.

Lagena radiculicola Vant. & Ledingham, Fairly heavy infection May 28, Vineland station, Ont. (G. A. Ledingham)

Polymyxa graminis Ledingham. Heavy infection May 29, Lincoln county, Ont. First report of this fungus on grasses other than

wheat, rye or barley (G. A. Ledingham). This obligate parasite was discovered at Toronto in 1930 in the roots of Marquis wheat seedlings grown in Ontario soil (Ledingham, Phytopath. 23:20. 1933).

Puccinia Clematidis (DC.) Lagerh. July 18 Macdonald College, Que.

Ustilago hypodytes (Schl.) Fr. This smut fairly heavily infected the grass in a vacant lot at Thamesville, Ont. The host was not identified with certainty.

Agropyron Smithii Rydb.

Claviceps purpurea (Fr.) Tul. Trace August 2, Kerdersley, Sask.

Agrostis canina L.

Claviceps purpurea (Fr.) Tul. July 15, St. Ferdinand, Que.

Agrimonia gryposepala Wallr.

Pucciniastrum Agrimoniae (Schw.) Tranz. Oct. 9, 1931. Ianoraie, Que.

Alnus incana (L.) Moench.

Taphrina Robinsoniana Gies. July, Berthier, Que. Although I have not critically examined the specimens of Taphrina, which Mr. Pomerleau kindly sent me in support of this determination, I am certain that the Farmers Rapids, Que., collection (1094) reported last year in the Can. Plant Disease Survey p. 117 as T. Alni-incanae fits exactly Giesenhagen's description of T. Robinsoniana. It is possible that T. Alni-incanae also occurs in North America, but as far as I am aware no one has critically examined a large number of collections and shown that the two species intergrade into each other, the only justification of uniting them as done by Seymour (Host Index p. 231). In the Farmers Rapids collection it was clearly demonstrated that the asci possess stalk cells and the mycelium forms a compact subcuticular hymenium. (I. L. Connors)

Alnus sitchensis Sarg.

Phyllactinia corylea (Pers.) Karst. Oct. 9, Summerland, B.C.

Ameranthus retroflexus L.

Cystopus Bliti (Biv.-Bern.) Lév. Sept. 2, Indian Head, Sask., common; Aug. 6, Berthier, Que.

Amelanchier sp.

Aprosporina Collinsii (Schw.) v. Höhn. June 12, Otterburne, Man.

Andromeda polifolia L.

Rhytisma Andromedae June 12, Prince Albert, Sask., May 22, Lanoraie, Que.

Apocynum cannabinum L.

Puccinia Seymouriana Arth. July 4, Ile Dupas, Que.

Aralia nudicaulis L.

Myrsopsora clavellosa (Serk.) Arth. July 21, Emma and Waskesiu Lakes. (J. P. Fraser and R.C. Russell)

Arctostaphylos rubra (Rehder & Wilson) Fernald

Thekasporea sparsa (Wint.) P. Magn. June 19, Point Churchill, Man. (Wm. C. Gussow).

Arctostaphylos Uva-ursi (L.) Spreng.

Chrysomyxa Arctostaphyli Diet. June 4, Duck Lake, Sask. Heavy infection, but of rare occurrence. Apparently first record in Saskatchewan. (W.P. Fraser)

Arisaema triphyllum (L.) Schott.

Uromyces Caladii (Schw.) Parl. Aug. 15, Lavaltrie, Que.

Aster cordifolius L.

Puccinia extensicola Plowr. July 4, St. Ignace, Que.

Aster novi-belgii L.

Coleosporium Solidaginis (Schw.) Thüm. July 30, 1931, Berthier, Que.

Aster umbellatus Mill.

Erysiphe Cichoracearum DC. Aug. 2, 1931, St. Cuthbert, Que.

Astragalus ?striatus Nutt.

Physalospora aurantia Ell. & Ev. Aug. 10, Dubuc, Sask. Several plants infected in a small area.

Berberis vulgaris L. var. purpurea

Puccinia graminis Pers. July 1, Berthier, Que. A heavy infection was found this year on cultivated common barberries in the nursery. Every leaf was so heavily covered with aecia that the shrubs were considerably disfigured. The seed came from France.

Bidens frondosa L.

Sphaerotheca Humuli (DC.) Burr. var. fuliginea (Schlecht.) Salm. Sept. 3, 1931, Ste. Elizabeth, Que.

Calamagrostis canadensis (Michx.) Beauv.
Phyllachora graminis (Pers.) Fockl. Aug. 20, Ste. Elizabeth,
 Que.

Caltha palustris L.
Puccinia calthaecola Schroet. July 24, Waskesiu Lake, Sask.

Capsella Bursa-pastoris (L.) Medic
Cystopus candidus (Pers.) de Bary, Sept. 18, Queens county,
 P.E.I.

Carex aquatilis Wahl
Cintractia Caricis (Pers.) Magn. July 24, Prince Albert
 National Park. Eighty to 90 per cent of the heads were more or
 less smutty.

Chenopodium album L.
Puccinia subnitens Diet. July 1, Quill Lake, Sask. (T.
 Arnason). First collection on this host in Saskatchewan.

Chelone glabra L.
Septoria Wilsonii Clinton, Sept. 8, 1931, Lanoraie, Que.

Chrysanthemum Leucanthemum L.
 Yellows (Virus). One hundred per cent of the plants of this
 weed and Erigeron canadensis L. were diseased in test plots at
 Fredericton, N.B. The disease was widespread and destructive on
 them. Also 10 per cent of the plants of Cirsium arvense (L.)
 Scop. were affected at the Experimental Farm, Fredericton. (See
 China Aster Yellows)

Cicuta occidentalis Greene
Puccinia Cicutae Lasch. Sept. 12, Saskatoon, Sask. (W. P.
 Fraser). Probably the first collection in Saskatchewan.

Clematidis virginiana L.
Puccinia Clematidis (DC.) Lag. July 15, St. Ferdinand, Que.

Comandra pallida A. DC.
Cronartium Comandrae Pk. July 24, Turtle Lake, Sask. (W.P.
 Fraser).
Puccinia Comandrae Pk. July 24, Turtle Lake, Sask. (W. P.
 Fraser). (First record of this species in Saskatchewan.)

Conringia orientalis (L.) Dumort.
Plasmodiophora Brassicae Woron. Sept. 30, Queens county.

P.E.I. Very severe. (R. R. Hurst)

Cornus stolonifera Michx.

Phyllostictia corylea (Pers.) Karst. Oct. 9, Summerland, B.C.

Corylus americana Walt.

Gnomoniella Coryli (Batsch.) Sacc. July 15, 1931, Lake Beauport, Que.

Phyllactinia corylea (Pers.) Karst. Sept. 15, 1931, L'Assomption, Que.

Dulichium arundinaceum (L.) Britt.

Puccinia Dulichii Syd. (= P. extensicola Plowr.) Sept. 24, Berthier, Que.

Elymus innovatus Beal

Claviceps purpurea (Fr.) Tul. July 25, Prince Albert National Park, Sask.

Eupatorium purpureum L.

Erysiphe Cichoracearum DC. Sept. 3, 1931, Lanorie, Que.

Fragaria virginiana L.

Marssonina Potentillae (Desm.) Magn. July 4, Berthier, Que.

Fraxinus americana L.

Puccinia sparganoides Ell. & Barth. June 24, 1931, Berthier, Que.

Gaura coccinea Pursh

Uromyces plumbierius Fk. June 16, Saskatoon, Sask.; June 9, Wawenese, Man. (1900).

Helianthus annuus L.

Puccinia Helianthi Schw. Sept. 27, Berthier, Que.

Hieracium canadense Michx.

Puccinia Hieracii (Schum.) H. Mart. Aug. 25, Berthier, Que.

Hordeum jubatum L.

Puccinia graminis Pers. July 28, Indian Head, Sask.

Ustilato Lorentziana Thum. June 29, Saskatoon, Sask.

Houstonia longifolia Gaertn.

Uromyces houstoniatus J.L. Sheldon, June 11, Macdowall, Sask.

- Ilex verticillata (L.) Gray
Rhytisma Ilicis-canadensis Schw. July 23, 1931, Berthier, Que.
- Iris versicolor L.
Heterosporium gracile (Wallr.) Sacc. Sept. 15, 1931, Joliette, Que.
- Iris sp. (cult.)
Heterosporium gracile (Wallr.) Sacc. Aug. 15, Lavaltrie, Que.
- Juglans cinerea L.
Marssonina Juglandis (Lib.) Magn. Sept. 2, 1930, Berthier, Que.
- Juniperus communis L. var. depressa Pursh.
Gymnosporangium clavariaeforme (Jacq.) DC. Annapolis county, N.S. Trace
- Kalmia angustifolia L.
Lycosphaerella colorata (Pk.) Earle, Apr. 21, 1931, Berthier, Que., July 5, Franklin, Que.
- Lawn Grass
Erysiphe graminis DC. Sept. 23, 1930, Berthier, Que.
- Ledum groenlandicum Oeder
Chrysomyxa ledicola Lagerh. June 27, Berthier, Que.
Gloeosporium Ledi Schroet. July 1, Berthier, Que.
- Lepidium densiflorum Schrad.
Cystopus candidus (Pers.) Lév. June 21, Saskatoon, Sask.
- Lonicera (cult.)
Microsphaera Alni (DC.) Salm. Sept. 4, 1930, Berthier, Que.
- Lycopus uniflorus Michx.
Puccinia angustata Pk. July 1, Berthier, Que.
- Malva rotundifolia L.
Septoria malvicola Ell. & Mart. Aug. 7, Lanoraie, Que.
- Malva sp. (cult.)
Puccinia malvacearum Berk. Aug. 28, Berthier, Que.
- Mentha canadensis L.
Puccinia angustata Pk. Sept. 1931, Berthier, Que.

Mitella nuda L.

Puccinia Heucherae July 24, Waskesiu Lake, Sask.

Myrica Gale L.

Gronartium Comptoniae Arth. Sept. 6, 1931, Berthier, Que.

Nemopanthus mucronata (L.) Trel.

Microsphaera Alni (DC.) Salm. Sept. 29, 1930, Berthier, Que.

Rhytisma Illicis-canadensis, Sept. 8, 1931, Lanoraie, Que.

Oenothera pumila L.

Septoria Oenotherae Westd. June 21, Berthier, Que.

Oenothera Victorinii Gates

Erysiphe Polygoni DC. Oct. 8, 1930, St. Clet, Que.

Cnoclea sensibilis L.

Uredinopsis americana Syd. Aug. 15, 1931, Berthier, Que.

Oryzopsis asperifolia Michx.

Phyllachora graminis (Pers.) Eckl. Oct. 5, Berthier, Que.

Osmorrhiza longistylis (Torr.) DC.

Puccinia Pimpinellae Aug. 8, Pike Lake, Sask. (W.P. Fraser).

First report of this rust from Saskatchewan.

Osmunda cinnamomea L.

Uredinopsis Osmundae Magn. Aug. 9, Lanoraie, Que.

Osmunda regalis L.

Uredinopsis Osmundae Magn. Sept. 2, 1931, St. Cuthbert, Que.

Petasites palmata (Ait.) Gray

Puccinia conglomerata (Strauss) Schmidt. & Kunze. July 24, Waskesiu Lake, Sask.

Phalaris arundinacea L.

Claviceps purpurea (Fr.) Tul. July 23, Berthier, Que.

Picea mariana (Mill.) BSP.

Chrysomyxa ledicola Lagerh. Aug. 8, Berthier, Que.

Pinus Banksiana Lamb.

Coleosporium solidaginis (Schw.) Thüm. June 4, Duck Lake, Sask. (W.P. Fraser) Infection heavy, common.

Pinus resinosa Ait.Coleosporium Solidaginis (Schw.) Thüm. June 23, Berthier, Que.Pinus Strobus L.Cronartium ribicola Dietrich, May 1, 1931, Berthier, Que. For the distribution and importance of white pine blister rust in Quebec see the Can. Plant Disease Survey for 1931 p. 104.Pinus sylvestris L.Peridermium sp. (Woodgate rust) May 15, Berthier, Que. Many trees were found bearing aecia during the spring of 1932.Plantago major L.Erysiphe Cichoracearum DC. Sept. 2, 1931, Berthier, Que. Oct. 31, Charlottetown, P.E.I. Heavy.

Yellows (Virus) 2 per cent of the plants in the test plots at Fredericton, N.B. The disease is widespread on this weed.

Polygonum aviculare L.Erysiphe Polygoni DC. Aug. 1, Queens county, P.E.I. Heavy.Uromyces Polygoni (Pers.) Fuck. Aug. 20, Prince county, P.E.I. Heavy.Polygonum ?Hydropiper L.Sphacelotheca Hydropiperis (Schum.) de Bary Sept. 9, Berthier, Que.Polygonum Persicaria L.Puccinia Polygoni-amphibii Pers. Sept. 6, 1931, Berthier, Que.Polygonum virginianum L.Ustilago anomala J. Kunze. Sept. 8, Berthier, Que.Populus balsamifera L.Fusicladium radiosum (Lib.) Lindr. July 9, 1931, Berthier, Que.Populus deltoides Marsh.Fusicladium radiosum (Lib.) Lindr. July 9, 1931, Berthier, Que.Melampsora medusae Thüm. Aug. 25, 1930, Berthier, Que.Populus nigra L. var. italica Du RoiSclerotium bifrons Ell. & Ev. June 24, Lavaltrie, Que.Populus tremuloides Michx.Fusicladium radiosum (Lib.) Lindr. June 22, Berthier, Que.

Hypoxylon pruinaum (Klotzsh) Cke. Aug. 5, Blucher, Sask.
Ten per cent of the trees in one bluff in the "bleeding" stage.

Portulaca oleracea L.

Cystopus Portulacae (DC.) Lév. July 15, Saskatoon, Sask.
Heavy and common on this weed, wherever it is abundant, Queens
county, Aug. 5, Heavy.

Prenanthes alba L.

Sphaerotheca Humuli (DC.) Burr. var. fuliginea (Schl.) Salm.
Aug. 18, 1931. St. Joseph de Sorel, Que.

Prunus pennsylvanica L.f.

Cylindrosporium hiemale Higg. Aug. 21, Berthier, Que.

Prunus virginiana L.

Cylindrosporium lutescens Higg. Sept. 2, 1930, Berthier, Que.

Psedera quinquefolia (L.) Greene

Uncinula necator (Schw.) Burr. Sept. 28, 1931, St. Ferdinand,
Que.

Psoralea Argophyllae Pursh.

Uromyces Argophyllae Seym. I. June 29, Saskatoon, Sask.

Pteridium latiusculum (Desv.) Maxon

Cryptomyces Pteridis (Reb.) Rehm. Aug. 15, 1931, Berthier,
Que.

Quercus rubra L.

Septoria querceti Thüm. Sept. 2, 1930, Berthier, Que.

Ranunculus acris L.

Erysiphe Polygoni Aug. 16, St. Eleanors, P.E.I.

Raphanus Raphanistrum L.

Erysiphe Polygoni DC. Sept. 15, greenhouse, Charlottetown,
P.E.I.

Rhamnus alnifolia L'Her

Puccinia coronata Corda, June 22, Berthier, Que.

Rhamnus cathartica L.

Puccinia coronata Corda, June 22, Berthier, Que.

Rhododendron canadense (L.) BSP.

Thekapsora minima (Arth.) Syd. Aug. 9, Lanoraie, Que.

Rhus Toxicodendron L.

Pileolaria Toxicodendri (Br. & Rav.) Arth. Sept. 20,
Lanoraie, Que.

Ribes Cynosbati L.

Cronartium ribicola Dietrich, Sept. 17, 1931, Berthier, Que.

Ribes glandulosum Weber (R. prostratum L'Her.)

Cronartium ribicola June 1, 1932, Berthier, Que.

Puccinia Pringsheimiana Lagerh. June 14, Berthier, Que.

Ribes Grossularia L.

Cronartium ribicola, Aug. 18, St. Alexis, Que.

Ribes lacustre (Pers.) Poir.

Cronartium ribicola, Nov. 1, 1931, St. Alexis, Que.

Ribes nigrum L.

Cronartium ribicola, Aug. 29, 1931, Berthier, Que.

Ribes sp. (wild)

Puccinia Ribis DC. July 24, Prince Albert National Park, Sask.

Rosa blanda Ait.

Phragmidium americana Diet. Sept. 27, Berthier, Que.

Sphaerotheca pannosa (Wallr.) Lévl. Sept. 8, 1930, Berthier,

Que.

Rosa sp. (cult.)

Marssonina Rosae (Lib.) Died. Very common in the region
especially in nurseries. Sept. 21, 1931, Berthier, Que.

Phragmidium americanum Diet. Aug. 15, Berthier, Que.

Rubus idaeus L.

Pucciniastrum americanum (Farl.) Arth. Sept. 19, St. Gabriel,
Que.

Rubus triflorus Richards

Gymnoconia Peckiana (Howe) Trotter, May 20, 1931, Berthier,
Que.

Rubus sp. " Wild

Pucciniastrum americanum (Farl.) Arth. Sept. 1, Queens county,
P.E.I. Common.

Rumex crispus L.

Olpidium sp. May 29, Wineland Station, Ont. Infection heavy.
Plants along bank of stream. (G.A. Ledingham)

Salix discolor Muhl.

Rhytisma salicinum (Pers.) Fr. Aug. 14, 1931, Berthier, Que.

Uncinula Salicis (DC.) Wint. Sept. 28, 1930, Lanoraie, Que.

Salix sp.

Fusicladium saliciperduum (All. & Tub.) Tub. July 1, Ste.

Anne de la Pocatière, Que.

Melampsora Biglowii Thüm. Sept. 15, 1931, Lanoraie, Que.

Melampsora Humboldtiana Speg. Sept. 8, Lanoraie, Que.

Sambucus canadensis L.

Microsphaera Alni (DC.) Salm. Sept. 17, 1930, Berthier, Que.

Sanguisorba canadensis L.

Gloeosporium Sanguisorbae Eckl. Aug. 21, Ste. Elizabeth, Que.

Scirpus paludosus A. Nels.

Uromyces Scirpi (Cast.) Burr. Sept. 16, Vonda, Sask.

Scirpus validis Vahl.

Puccinia angustata Pk. Aug. 26, Pike Lake, Sask. (W.P. Fraser).

Scirpus sp.

Puccinia angustata Pk. Sept. 8, 1931, Lanoraie, Que.

Scrophularia leporella Bicknell

Septoria Scrophulariae Pk. Aug. 24, Berthier, Que.

Setaria glauca (L.) Beauv.

Ustilago neglecta (L.) Beauv. Sample received from the
Dominion Seed Branch Dec. 22, 1931. Origin not reported. Green
seeds of this host smutted with U. neglecta were present in clover
seed. (I. L. Conners)

Setaria viridis (L.) Beauv.

Sclerospora graminicola (Sacc.) Schroet. Aug. 8, Oxbow, Sask.
Four per cent of the plants affected in one field.

Sium cicutaefolium Schrank

Uromyces Scirpi (Cast.) Burr.. July 4, Berthier, Que.

Solidago canadensis L.Coleosporium Solidaginis (Schw.) Thüm.Solidago humilis Pursh.Coleosporium Solidaginis Sept. 8, 1931, Lanoraie, Que.Solidago Randii (Porter) Britt.Puccinia ?Virgaureae (DC.) Lib. June 29, Lanoraie, Que.Solidago rugosa Mill.Coleosporium Solidaginis (Schw.) Thüm. Aug. 10, Beatty, Sask.

Sept. 5, 1930, Berthier, Que.

Erysiphe Cichoracearum DC. Sept. 2, 1931, St. Cuthbert, Que.Solidago sp.Erysiphe Cichoracearum DC. Aug. 1, Queens county, P.E.I.Sorbus americana MarshEntomosporium maculatum Lév. Sept. 2, 1930, Berthier, Que.Spartina Michauxiana Hitchc.Puccinia spargnioides Ell. & Barth. Sept. 6, 1931, Berthier, Que.Strophostyles helvola (L.) Britt.Uromyces appendiculatus (Pers.) Link, Sept. 20, Lanoraie, Que.Taraxacum officinale WeberPuccinia Hieracii (Schum.) Mart. July 22, Indian Head, Sask.

Common.

Sphaerotheca Humuli (DC.) Burr. var fuliginea (Schlecht.) Salm.

July 22, Indian Head, Sask. Common.

Tragopogon porrifolius L. (Cult.)Cystopus cubicus (Strauss) Lév. Aug. 4, Berthier, Que. Infection quite heavy in gardens.Trifolium hybridum L.Uromyces Trifolii (Hedw.f.) Lév. Sept. 3, 1931, Ste. Elizabeth, Que.Ulmus americana L.Gnomonia ulmea (Schw.) Thum. Aug. 25, 1931, Deschambault, Que.Taphrina Ulmi (Fockl.) Johans. May 9, 1931, Berthier, Que.

Disease quite widespread in spring, causing damage in the nurseries.

Urtica gracilis Ait.Puccinia Urticae Lagerh. June 19, Berthier, Que.; June 19,

Point Churchill, Man. (Wm. C. Gussow)

Urtica Lyallii Wats.

Puccinia Urticae Lagerh. Macdowall, Sask.

Veratrum viride Ait.

Puccinia Veratri Duby July 15, St. Ferdinand, Que.

Verbena hastata L.

Septoria Verbenae Gerard, Sept. 20, Ianoraie, Que.

Viburnum eradiatum (Oakes) House (= V. pauciflorum Pylaie)

Puccinia Linkii Klotzsch, July 24, Waskesiu Lake, Sask.
(W. P. Fraser and R. C. Russell)

Vicia Cracca L.

Uromyces Fabae (Pers.) de Bary, Aug. 20, Berthier, Que.

Viola nephrophylla Greene

Puccinia Violae DC. Sept. 2, Berthier, Que.

Woodwardia virginica (L.) Smith

Uredinopsis Struthiopteridis Strömer. Sept. 1, Berthier, Que.

Xanthium commune Britt.

Puccinia Xanthii Schw. July 1, Berthier, Que.

Weeds:

The following weeds were found infected with root knot (Cacomea radicola (Greef.) Cobb) when growing among infected tomatoes in greenhouses at Victoria, B.C. Plantago major, P. lanceolata, Leontodon autumnalis, Sonchus oleraceus, Senecio vulgaris, Cirsium arvense, Amaranthus retroflexus, Chenopodium album and cultivated lettuce. (J.E. Boshier)

Grasshoppers:

Entomophthora Grylli Fres. Many grasshoppers were attacked during the past summer in Manitoba. (G. R. Bisby)

Entomophthora Grylli was found on dead Arctiid caterpillars sent from the Entomological Laboratory, Chatham, Ont. The caterpillars were being reared in the laboratory when they succumbed. (E.S. Dowding)

INDEX OF HOSTS

Only the names of the cultivated plants have been included in this index. For diseases on plants not under cultivation the section on "Diseases of Miscellaneous Plants" may be consulted.

Alfalfa	24	Elm	83
Apple 60,	81	Firethorn	83
Apricot	67	Flax	29
Ash	82	Geranium	89
Asparagus	32	Gladiolus	89
Azalea	87	Gooseberry	70
Balsam	87	Grape	71
Balsam Fir	82	Grapefruit	81
Barley	17	Grasses, Cultivated . .	30
Basswood	82	Hawthorn	83
Bean	32	Holly	89
Bean, Broad	34	Hollyhock	89
Beech	82	Honeysuckle	90
Beet	34	Hop	39
Blackberry	67	Horsechestnut	83
Blueberry	68	Iris	90
Cabbage 35,	59	Kohlrabi	40
Calla	87	Ladyslipper	91
Camellia	87	Larkspur	91
Campanula	87	Lemon	81
Cantaloupe	35	Lettuce 40,	59
Caragana	87	Lilac	91
Carnation	87	Lily	91
Carrot	36	Lobelia	91
Cauliflower	36	Loganberry	72
Celery	37	Lupine	92
Cherry	68	Mangel	30
Chestnut	82	Maple	83
China Aster	87	Mountain Ash	84
Chrysanthemum	88	Narcissus	92
Clematis	88	Nasturtium	92
Clover, Common	26	Oak	84
Clover, Sweet	27	Oats	12
Corn	28		
Cucumber 38,	59		
Currant	69		
Dahlia	89		
Egg Plant	38		

Onion	40
Orange	80
Pansy	93
Pea	41
Peach	72, 81
Pear	74
Peony	93
Petunia	93
Phlox	93
Pine	84
Plum	85, 81
Poplar	85
Potato	43, 59
Raspberry	76
Rhodendron	94
Rhubarb	51
Rose	94
Rose of Sharon	95
Rye	22
Salsify	51
Snapdragon	95
Snowberry	95

Soy Bean	30
Spinach	51
Spruce	85
Stock	96
Strawberry	79, 81
Sugar Beet	52
Sunflower	29
Sweet Corn	52
Sweet Pea	96
Tobacco	53
Tomato	55, 59
Transportation Diseases	58, 80
Tulip	97
Tulip Tree	86
Turnip	57
Vegetable Marrow	58
Watermelon	59
Wheat	1
Willow	86
Zinnia	97

9 M
 red